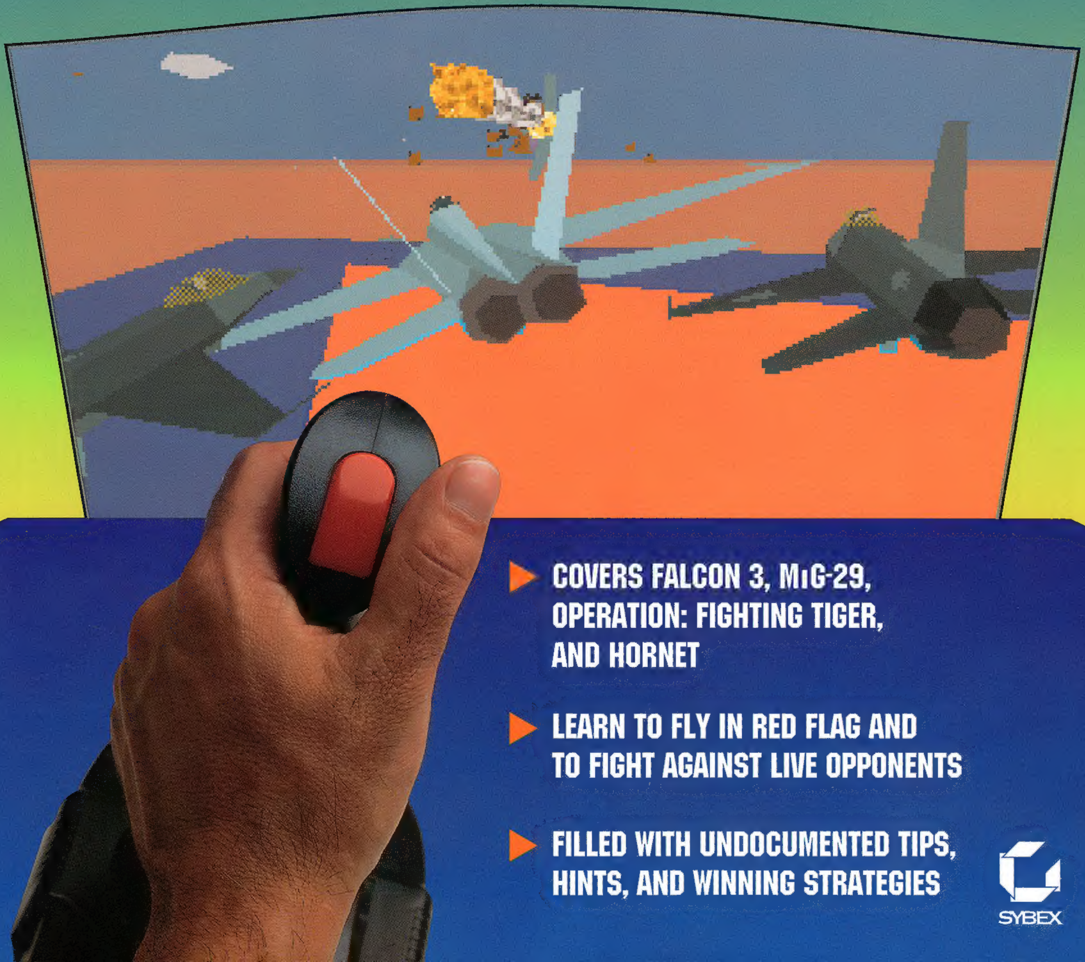
FALCON® 3

STRATEGIES AND SECRETS

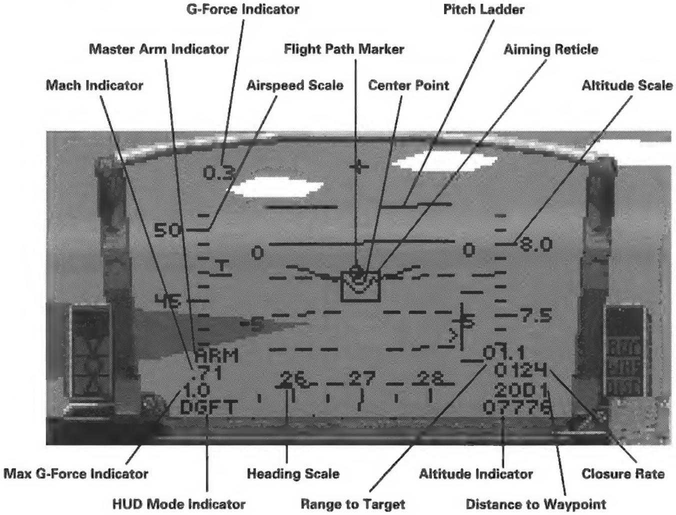
GUY HART-DAVIS



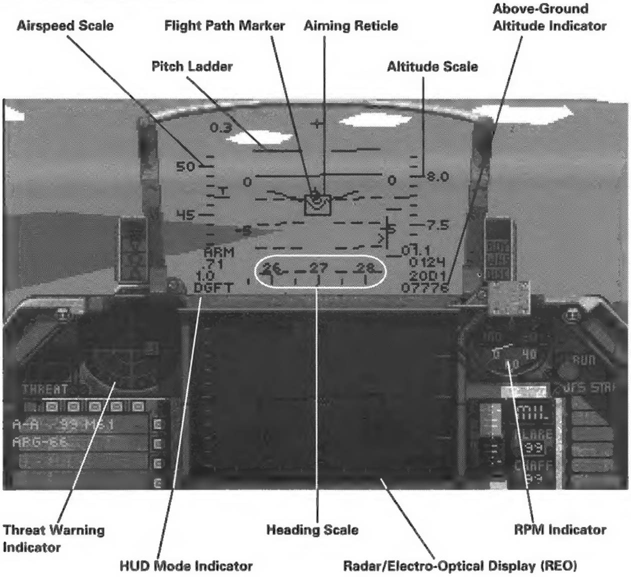
- COVERS FALCON 3, MiG-29, OPERATION: FIGHTING TIGER, AND HORNET
- LEARN TO FLY IN RED FLAG AND TO FIGHT AGAINST LIVE OPPONENTS
- FILLED WITH UNDOCUMENTED TIPS, HINTS, AND WINNING STRATEGIES

SYBEX

F-16 HUD



F-16 COCKPIT



Aircraft Control

Nose down/up	↓/↑
Bank left/right	←/→
Left/right rudder	[/]
Increase/decrease throttle	+/–
Afterburners on/off	/
Afterburner stage up/down	>/<

Selecting and Firing Weapons

Select air-to-ground weapons	Backspace
Select air-to-air weapons	↵
Toggle ILS on	\
Fire current weapon	spacebar
Increase bomb ripple	'
Decrease bomb ripple	;

Radar Control

Toggle radar on and off	R
Toggle cockpit map on and off	C
Engage NAM radar	F5
Engage ACM radar	F6
Toggle GM radar on and off	F7
Toggle rivers and roads (GM)	Y
Change radar scan distance	F8
Change radar azimuth scan	F9
Change radar antenna elevation	F10
Run IFF check	N
Select target	T
Clear radar lock	X
Lock radar	Z

Selecting Views

Front view	3 (1 on keypad)
Left view	4 (7 on keypad)
Rear view	5 (3 on keypad)
Right view	6 (9 on keypad)
Scroll view	Scroll Lock
Up view	U
Down view	Shift+U
Satellite view	1
Ground view	2
Target/Missile/Enemy view	Q
Wingman view	7
Padlock view	8 (* on keypad)
Track view	9
Chase view	0

Zooming and Rotating

Zoom in/out	F1/F2
Rotate left/right	F3/F4
Rotate up	Shift+F3
Rotate down	Shift+F4
Finer rotation movement	Ctrl+(above keys)

Using Countermeasures

Toggle ECM on and off	E
Fire chaff	Del
Fire flares	Ins

Flight Control

Toggle autopilot	A
Speed brakes	B
Flaps	F
Landing gear up/down	G
Wheel brakes on/off	W
Eject	Ctrl+E 3x(fast)

Wingman Commands

Break left	Shift+A
Break right	Shift+D
Break high	Shift+W
Break low	Shift+X
Fly straight and level	Shift+S
Bypass current waypoint	Shift+B
Return to previous waypoint	Shift+V
Keep radio silence	Shift+R
Bracket left	Shift+Z
Bracket right	Shift+C
Engage	Shift+E
Disengage	Shift+Q
Drag left	Shift+2
Drag right	Shift+3
AWACS navigation info	Shift+N

Other Keys

Engage accelerated mode	Tab
Lock accelerated mode (toggle)	Shift+Tab
Activate menu bar	Esc
Change HUD color	H
Pause simulation	P
Toggle sound on and off	S

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Library of Congress Card Number: 94-65688
ISBN: 0-7821-1503-9

Manufactured in the United States of America
10 9 8 7 6 5 4 3 2 1

To my grandfather, Rupert

ACKNOWLEDGMENTS

I'd like to thank Gary Masters for developmental support, guidance, and enthusiasm; Aron Bonar for technical help well beyond the call of duty; Abby Azrael for careful, patient, and above all good-humored editing; John Corrigan for great work on the graphics; Ann Dunn for typesetting the text; Ingrid Owen for designing the book and putting the pieces together; Emily Smith for making sure that the pieces fitted; and Ted Laux for the index.

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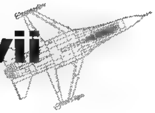

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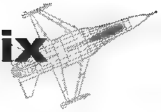

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INTRODUCTION

6 A.M. 10,000 feet over Bosnia, 1994. You're patrolling the Sarajevo skies in your F-16, watching for Serbian attacks on the UN-held roads and cities. Suddenly, your Threat Warning Indicator blares at you: You've been locked up by a Serbian MiG-29 Fulcrum! You slap on the afterburners and throw your Fighting Falcon about the sky to break the radar lock—successfully—then seek to turn the tables. Screaming around in an Immelmann, you fire your last two heat-seeking Sidewinders at him… only to see them explode uselessly in the flares he's released. So you grit your teeth and go after the MiG with your M61A1 cannon. Twisting to stay on his tail, you hold your fire till the range drops, and then press the trigger. Bits fly off the MiG-29. You fire again—and the Fulcrum bursts into flames. Scratch another bad guy for Major Nadir….

Welcome to Falcon 3.

Falcon 3 has been the best air combat–simulator around since it was released in the fall of 1991. Not only could you fly shoot-'em-up, arcade-style games in Instant Action, but you could train in Red Flag just as the air force pilots train at Nellis Air Force Base, Nevada; and you could study military strategy by planning and running your own campaigns.

Since then Spectrum HoloByte has released three major add-on packages that have quadrupled the appeal of the Falcon simulation. Operation: Fighting Tiger adds three new campaigns to Falcon 3—you get to fly in Korea, Pakistan, and Japan's Kurile Islands. MiG-29 gives you the enemy perspective on each of those campaigns, and a thrilling new aircraft to fly. Finally, Hornet adds the challenge of carrier-based operations and a new campaign theater, Bosnia.

WHO IS THIS BOOK FOR?

If you're new to Falcon 3, this book will get you up and running with it in next to no time. If you've flown Falcon 3 and are looking for more action, this book will take you through Operation: Fighting Tiger, MiG-29, and Hornet.

HOW TO USE THIS BOOK

Here's how this book is laid out. Part One, *Up and Running with Falcon 3*, is designed to get you up in the air with a minimum of hassle. Chapter 1, *Just Do It!*, shows you how to get straight into the thick of the fray in Instant Action, Falcon 3's arcade-style shoot-'em-up module. You'll find yourself at 7500 feet over Israel facing unsophisticated enemies, but plenty of them. Take out as many of them as you can before they get you!

If you haven't installed Falcon 3 yet, brace yourself—installation is one of the most difficult things about Falcon 3. Turn to Appendix A and you'll find it a breeze.

Once you've got the hang of shooting things, dip into Chapters 2, 3, and 4. In Chapter 2, you'll learn how to find a suitable configuration for Falcon 3; in Chapter 3, you'll learn the important instruments in the cockpit and how to read them; and in Chapter 4, you'll meet the different views that let you spot the enemy in time and the weapons you'll use to nail him. By the end of that, you'll be raring to plunge back into action and put your knowledge to use. Chapter 5 discusses how Instant Action scores your missions and shows you tactics you can use to maximize your scores.

In Part Two, *Red Flag*, you'll learn how to use the Red Flag module to train yourself and the pilots under your command. Chapter 6 introduces you to the different parts of Red Flag. Chapter 7 teaches you such basics of flying as takeoff, landing, and navigation—vital skills for all your missions to come. Chapter 8 discusses creating your own missions in Red Flag to hone your skills to the point where you're ready for Campaign, and tells you how to access the Falcon 3 missions and utilities available on the SYBEX CompuServe forum.

In Part Three, *Campaign*, you'll learn how to set up, run, and win a campaign. Chapter 9 discusses campaign theory and practice; Chapter 10 looks at the new campaigns in Operation: Fighting Tiger, together with their new aircraft, new commands, and new maneuvers.

Part Four, *MiG-29, Hornet*, and *Advanced Flying Tactics*, introduces you to these two exciting add-on packages for Falcon 3 and then discusses advanced flying tactics. Chapter 11 discusses MiG-29 and Chapter 12 discusses Hornet, concentrating on the salient differences between them and the

F-16 and on how you can transfer your experience at flying the F-16 to these new planes. Chapter 13 covers tactics.

Appendix A shows you how to configure your machine for Falcon 3 and install Falcon 3 (and Operation: Fighting Tiger, MiG-29, and Hornet) on it so that they run with a minimum of trouble. Appendix B leads you through fighting head-to-head with live opponents using modem or network connections. Finally, Appendix C discusses how to use the awesome High-Fidelity Radar mode in the F-16, MiG-29, and Hornet.

CONVENTIONS USED IN THIS BOOK

I've used a few conventions in this book to make it easier to read and understand:

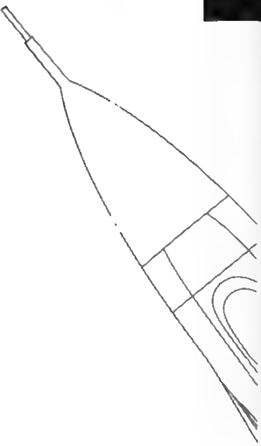
- First, when you need to press two or more keys together, I've indicated this with a + sign. For example, "press **Alt+A**" means that you should hold down the Alt key while you press the A key (and then let go of the Alt key, of course—unless you're especially enjoying yourself).
- Second, for menu sequences, I've used the ➤ arrow to indicate successive menu choices. For example, "choose Options ➤ Change Scale ➤ 8×" means that you would choose Options, then choose Change Scale, then choose 8×.
- Third, there's the Geneva Convention, which provides rules for warfare. We'll get to these rules in due course—and how to break them.
- Fourth, I've used **boldface** for stuff you might want to type in or keys you might want to press.
- Fifth, you'll find Notes, Tips, and Warnings throughout the book to draw your attention to info you mustn't miss.

A NOTE ON POLITICAL CORRECTNESS

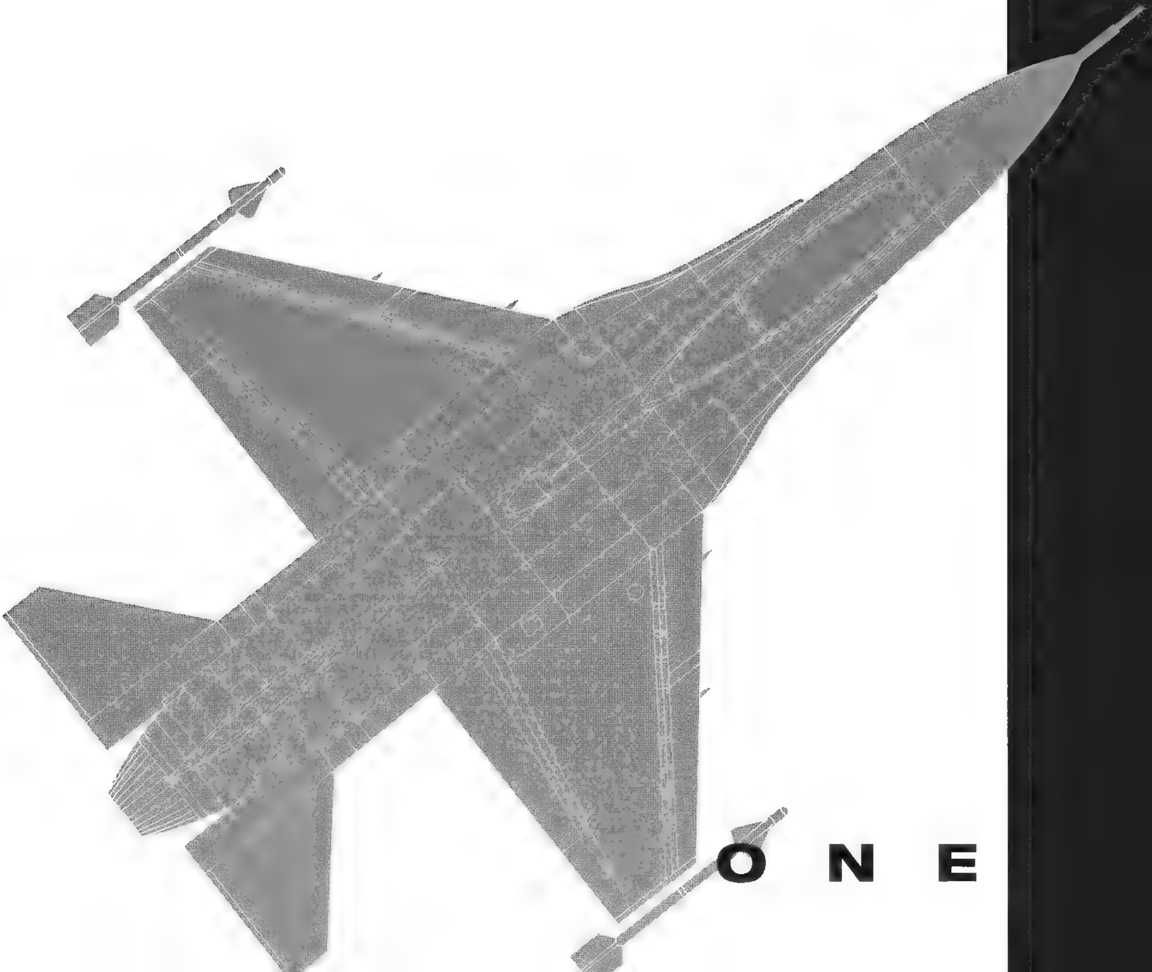
As you run Falcon 3, MiG-29, and Hornet, you'll notice that almost all the pilots are male—from their voices in the radio messages to their faces in the Pilot Information screen. For clarity and simplicity, I've assumed throughout this book that both friend and foe are male, and used male pronouns to refer to them. (Perhaps the Pentagon's approval of women flying in combat will bring more women into future versions of Falcon….)

PART ONE

UP AND RUNNING WITH FALCON 3



JUST DO IT!



ONE

ONE

Welcome to Falcon 3.0! This chapter will get you into action immediately in Falcon 3.0's Instant Action mode, with as little fussing as possible. For Instant Action, you need only minimal theory and can get far with sharp eyes and fast reactions.

If you've already got Falcon 3.0 installed and running on your computer, congratulations! If not, your first and biggest fight will be freeing up enough conventional memory to install and run Falcon 3.0 (and Operation: Fighting Tiger, MiG-29, and Hornet). Check out Appendix A for a brisk run through installation, including troubleshooting tips to solve all problems you're liable to encounter.

WHAT IS INSTANT ACTION?

Instant Action is Falcon 3.0's arcade-game–style module. Start it up and you'll find yourself at 7500 feet over Kuwait. There'll be plenty of enemies about, and if you don't go get them, they'll come get you. You have unlimited fuel and armaments, so you can keep going until the pressure of enemies proves too much for you.

Instant Action is straightforward and unsubtle: There's no planning missions, no assigning pilots and equipment, and no strategy, just head-down blood and guts. Your only goal is to get the bastards before they get you. You'll love it.

As you progress with Falcon 3.0's other modules, Red Flag and Campaign, you'll probably return to Instant Action frequently because it's a great place to try out maneuvers and improve your situational awareness and dogfighting skills. For now, just concentrate on getting in the air and scoring yourself a few kills. Once you've got the hang of things, we can do some ground time and see how all the parts of Falcon 3.0 work.

In this chapter, you'll start Falcon 3.0, set a basic configuration and difficulty level for flying in Instant Action, and then zip straight into action.

STARTING FALCON 3

To fire up Instant Action, first, get Falcon 3.0 running:

1. Switch on your computer and get to the DOS prompt.
2. To change to the Falcon 3.0 directory, type:

   ```
   CD FALCON3↵
   ```
3. To start Falcon 3.0, type:

   ```
   FALCON3↵
   ```
4. You'll see Falcon 3.0's opening animation sequence—an F-16 blowing the bejesus out of a MiG-29.
5. Next, the credits will roll. After them, you'll find yourself in the War Room (see Figure 1.1).

TIP

When you get tired of this sequence and the *Fox Two, Fox Two; Good Kill, Good Kill* radio messages—and believe me, you will—press Esc to skip it. Same for the credit screens of Falcon 3.0's designers and their nicknames—they go on for an ungodly length of time.

We'll get to the rest of the War Room in the coming chapters, but for now, click on the CONFIG screen (the leftmost of the four fully visible TV monitors) to reach the Falcon 3.0 Difficulty Levels screen.

SETTING THE DIFFICULTY LEVELS

Falcon 3.0's Difficulty Levels screen is extremely flexible—you can choose any number of different custom configurations and have a different experience in each. As you hone your skills, you'll find yourself

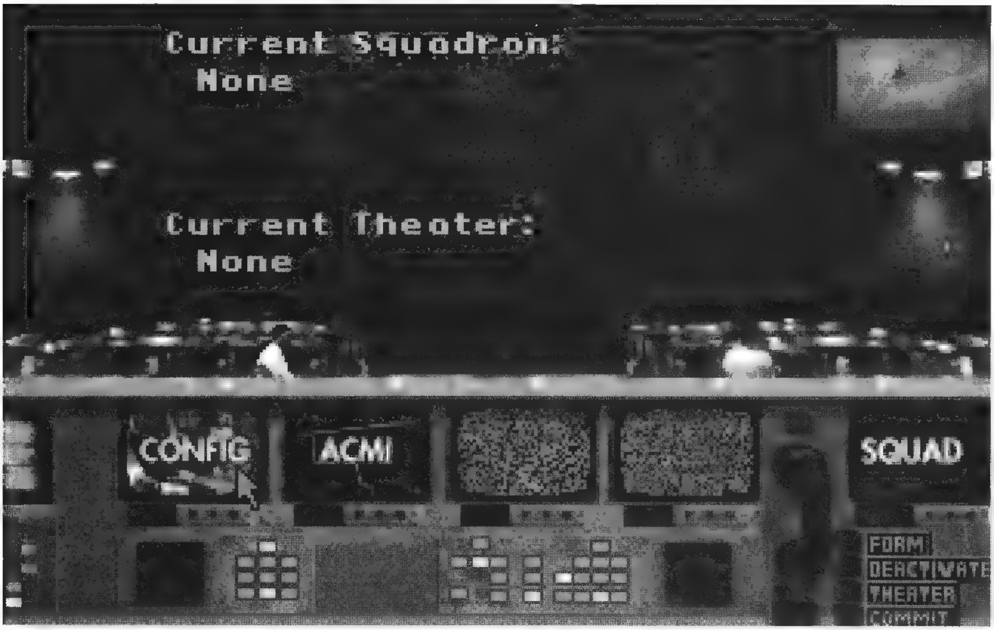
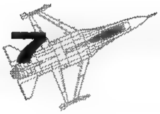


FIGURE 1.1 *The War Room—the basis for your operations in Falcon 3.0. For now, click on the CONFIG screen.*

coming back to the Difficulty Levels screen to make things a fraction harder. We'll discuss the various items in the Difficulty Levels screen in Chapter 2.

Right now, though, your goal is to get into Instant Action with suitable settings. Make the following settings in the Difficulty Levels screen by clicking on them with your mouse (did you get it running with Falcon 3.0?) or by moving around with the arrow keys (↑, ↓, →, and ←) and pressing ↵:

Setting	**Choose**
Enemy Logic Level	Trainee
Flight Model	Complex



Setting	Choose
Weapons Effectiveness	High
SAMS–AAA	None
HUD	A
Radar	SAD
Collisions	On
Redout–Blackout	On

Ignore the Limited Fuel, Limited Armament, and Limited Chaff–Flares settings for the moment—they don't apply in Instant Action. Nor does Intelligence—ignore that too.

You probably noticed that when you chose Trainee in the Enemy Logic Level area, the Custom light went on in the Skill Level area. Why not simply choose the Beginner level there, you ask? Well, briefly, because the Beginner level gives you a bunch of settings you don't really want, such as the Simple Flight Model and Collisions Off (ha!). More on this in Chapter 2.

When you've got all those options set, click the System Setup button at 12 o'clock in the Difficulty Levels screen to get to the System Setup screen.

CHECKING YOUR SYSTEM SETUP

We won't dwell on the System Setup screen settings here—they're explained in detail in Chapter 2—but we just need to check that your system is suitably configured to run Instant Action.

Flight Control: If you've got a joystick, make sure Joystick is selected. (If you've got a ThrustMaster, choose ThrustMaster.) Otherwise, stick with the Keyboard choice.

Detail Level: Choose Minimum if you've got a 16-MHz 386 or slower computer, Medium for a 20-MHz or 25-MHz 386, High for a 33-MHz 386, and Maximum for any speed of 486 or Pentium.

Background Sound: Choose Engine–Sidewinder.

Radio Messages and **Sound and Music**: When you installed Falcon 3.0, it should have detected your computer's sound arrangements, so Radio Messages and Sound and Music should indicate the type of sound equipment your computer has. If the information you see is wrong, choose the appropriate option.

Altitude Data and **Object Data**: Choose On unless you have limited expanded memory (see Appendix A for instructions on how to maximize expanded memory).

Music: Choose On.

Animation: Choose On.

When you've made these choices, click the Done button in the upper-right corner to exit the System Setup screen and get back to the War Room.

STARTING INSTANT ACTION

Now that you've set Falcon 3.0's difficulty levels and system setup, you're ready to plunge into action. From the War Room, click the upper-right monitor (the one that flashes *Instant Action*) to fire up Instant Action.

If you haven't calibrated your joystick yet, Falcon 3.0 will invite you to do so now. Move the stick to the required positions and click the trigger button. Click the Save As Default button if you want to save those settings so you don't have to deal with calibration again. Then choose Exit to start flying with that joystick calibration.

You'll see an opening animation sequence of an F-16 pilot getting into the cockpit, then of an F-16 taking off (don't worry—you'll learn how to take off in due course). Then you'll find yourself flying at 7500 feet heading for the enemy.

Okay. So far so good. Now press **P** to pause the simulation, and we can look quickly at what you're seeing, the weapons you've got, and how to use them. And if you're lucky, I'll throw in a few emergency strategies.

WHAT YOU'RE SEEING

As soon as you get up in the air in Instant Action, you should see something like Figure 1.2. (Don't worry if you're seeing a different time of day—we'll get to that in a moment.)

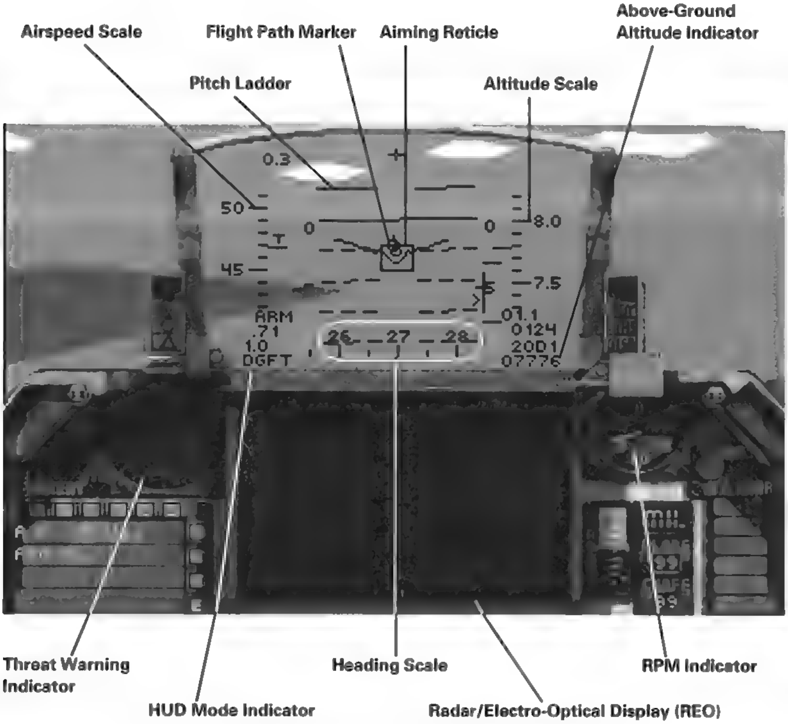


FIGURE 1.2 *The opening seconds of Instant Action: 7500 feet over Trouble*

The head-up display (HUD) is the enclosed area of sky in front of you with lots of information superimposed on it. We'll get to the fine points of the HUD in Chapter 3. For now, you need to know about the things labeled in Figure 1.2:

Pitch Ladder Check your *angle of attack* (your rate of climb or dive measured in degrees) to make sure you don't stall or dive into the ground. Solid bars mean you're climbing; dashed bars mean you're diving.

Airspeed Keep this above the 20 notch (that's 200 knots) so that you don't stall. As long as your airspeed is above the 20 notch, don't worry. Use the RPM indicator to check that your revs don't fall below 60.

Altitude Don't get too low—even in an F-16, the ground's pretty hard. The measurement is in thousands of feet—7.5 is 7500 feet, and so on. The Altitude Scale shows height above *sea* level; pay more attention to the Altitude Indicator in the bottom-right corner of the HUD (labeled in Figure 1.2), which shows height above *ground* level.

Heading Use the Heading Scale to follow any tips that AWACS gives you. This scale is in ten-degree increments.

Flight Path Marker This shows you the direction in which you are heading when you move the stick.

Aiming Reticle Use the circle to target your weapons; you should hit targets that are in range and locked on. Different symbols appear inside the Aiming Reticle when you load different weapons—more on that in a moment.

HUD Mode Indicator Use this to see which weapon system and HUD mode you've selected—for example, **2 MRM** shows you that you've got two medium-range air-to-air missiles (AIM-120s) selected; **DGFT** indicates that you've got M61A1 cannon selected.

Threat Warning Indicator This shows you enemy aircraft, SAMs, and radar-guided missiles that are within 30 miles of (and are targeting) your F-16. Your plane is in the middle of the TWI. Don't worry yet about the different symbols in the Threat Warning Indicator—just watch out for aircraft and missiles coming to get you.

Radar/Electro-Optical Display If you're feeling ambitious, use this to locate targets. We'll get into it in later chapters. Briefly, it shows you enemy altitude, enemy heading, enemy airspeed, the *aspect angle* (the horizontal angle from the tail of the enemy to the nose of your plane), the enemy bearing, and your closure rate on the enemy.

CONTROLLING YOUR F-16

If you've got a joystick, you should find using it pretty instinctive—to control the plane, just move the joystick as you would your head. Move the stick forward to push your plane's nose down and make it dive; move the stick back to pull the nose up and make it climb. Push the stick to the left or right to begin turning in that direction. To turn more sharply, pull back on the stick before pushing it to the left or right. But don't haul the stick about too much—you'll find your F-16 is plenty sensitive.

If you're using the keyboard, use the arrow keys to move the nose of the aircraft: Follow the rules outlined above for the joystick—↑ to push the nose down, ↓ to pull it up, → to bank right, and ← to bank left.

Piling On the Power

Without getting technical yet, I should warn you that you'll need to keep the revolutions up—keep them over 60 on the RPM Indicator to the right of the REO. Press + to increase thrust, – to decrease it. To kick in the afterburner, press the / key; to move up and down between the five afterburner modes, press > and < respectively. Press / again to cut the afterburner. Backing off the throttle by pressing the – key also turns off the afterburner.

LOOKING AROUND YOU

Falcon 3.0 offers a whole bunch of views, both inside and outside the cockpit. We'll get to the details of these in Chapter 3—for the moment, see how you can do with the four basic inside views:

Key (numeric keypad)	View
1	Front view
3	Rear view
7	Left view
9	Right view

For the time being, concentrate on the front view so that you can use the HUD and aim your weapons. But keep looking around—there should be plenty of enemies in the skies to keep you occupied.

CHOOSING AND USING WEAPONS

In Instant Action you have unlimited weapons (and fuel). We'll get into weapons in detail in Chapter 4; right now, let's get you set up with some air-to-air weapons.

The Stores Control Panel shows the type of weapon selected: A–A for air-to-air weapons, A–G for air-to-ground weapons. To switch from air-to-air mode to air-to-ground mode, press Backspace; press it again to cycle through the air-to-ground weapons. To switch from air-to-ground mode to air-to-air mode, press ↵; press it again to cycle through the air-to-air weapons.

Right now, make sure you've got air-to-air weapons mode selected. If it's not, press ↵. Figure 1.3 shows what you'll see with any of the missiles selected: a diamond in the Aiming Reticle.

When you get an enemy inside the Aiming Reticle and within visual range, the missile will often lock on automatically. The Aiming Reticle will flash to indicate the lock. Press the trigger on your joystick or the spacebar on the keyboard to fire the missile.

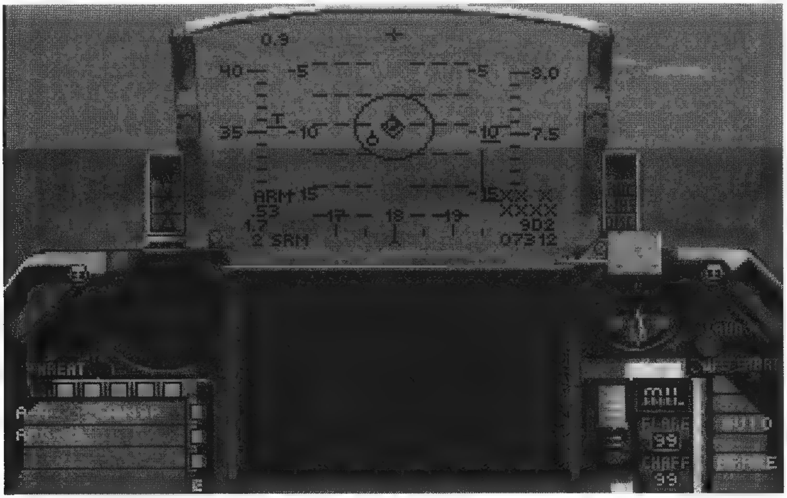


FIGURE 1.3 *Air-to-air mode with a missile selected*

Figure 1.4 shows what you'll see with the M61A1 gun selected: two lines forming the funnel, the point of which indicates where the shells will go. If you get the enemy within the funnel with his wings touching the sides, he should be close enough to hit. Again, use the trigger or the spacebar.

Figure 1.5 shows what you'll see when you shoot straight. Be ready to avoid the debris!

DEFENDING YOURSELF

You're itching for action, so there's no time to teach you an elaborate skein of defensive maneuvers. For the time being, try to avoid letting any enemy pilot get on your six (your six o'clock position, and by extension, what you sit on) and plant a missile up your rear end, or stitch you up with cannon fire.

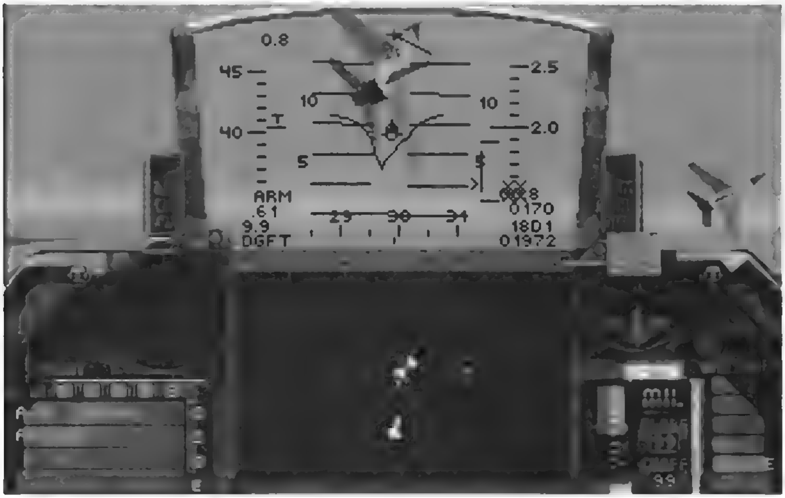


FIGURE 1.4 *Air-to-air mode with the M61A1 gun selected. The point of the funnel indicates where the shells will be delivered.*

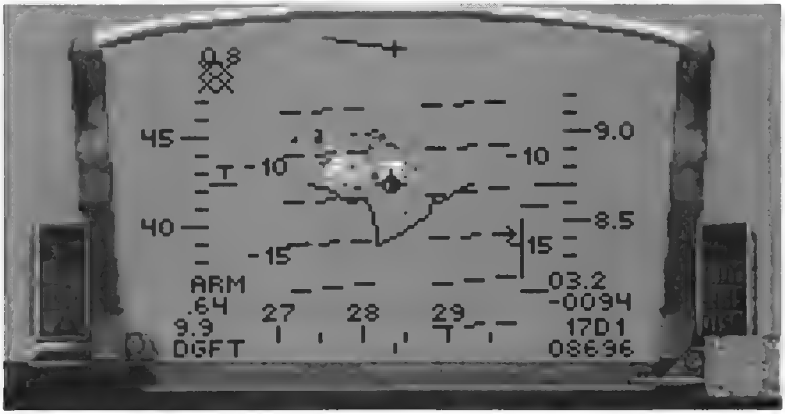


FIGURE 1.5 *Direct hit! Watch out for debris!*

If you see you've got a radar-guided or heat-seeking missile coming to make your acquaintance, try to confuse it by dropping chaff (press **Del**) or firing flares (press **Ins**). You've got unlimited supplies of each, so if in doubt, hammer both **Ins** and **Del**. We'll get into the theory of this later.

WARNING

Don't rely on flares when you're using your afterburner—your six will be hotter than the flares, and any heat-seeking missile will come straight up it.

STRATEGIES FOR STAYING ALIVE

If the enemy's about to stitch you up—or has already—but you're not ready to die yet, here's a crash course in maneuvers to prolong your life: how to avoid stalling (and how to recover from a stall that you didn't avoid), how to change the time of day, how to get back on even keel, how to abort the mission, and *in extremis*, how to eject.

AVOIDING STALLING

This isn't the time to get technical, but you need to know how to avoid stalling and how to recover from a stall. First, what *is* a stall?

Basically, in order to fly, an aircraft needs enough forward thrust—enough forward speed—to create lift. Below a certain speed—the *stall speed*—it won't generate enough lift to fly, and will stall. It'll also stall if you try to climb too steeply without enough speed.

An F-16 will stall at about 120 knots at ground level. Because the stall speed depends on the air pressure, the stall speed increases as you climb and the air pressure gets less.

RECOVERING FROM A STALL

When you stall, your F-16 will let you know about it PDQ. The nose will drop no matter how hard you pull the stick back, the stall light will come on, and the stall horn will blare at you.

Recovering from a stall in an F-16 is pretty easy *provided you have enough height.* (If you're too close to the ground, you're ready for the last of the Chinese Five Blessings—an easy death.) Push the nose down to pick up speed, and when you've gained it, pull up gently—not too fast, or you may stall again.

Practice stalling on purpose a few times to learn the techniques of recovery. Try piling on more power to pull out of the stall more quickly.

TIME-SHIFTING: IMPROVING YOUR VIEW OF THE ENEMY

To change the view of the time of day, press **Shift+T**. Falcon 3.0E (the latest release of Falcon 3.0), Operation: Fighting Tiger, MiG-29, and Hornet use four different times of day for missions: early morning, noon, late afternoon, and night. For example, you probably won't want to fly your first few Instant Action missions in the dark, because not being able to see the enemy can really cramp your style at first; press **Shift+T** until you find a time of day that suits you.

You can also use **Shift+T** for more subtle alterations, like moving the sun about the sky if the enemy tries to hide in it.

CHEATING WITH FALCON 3'S AUTOLEVEL FEATURE

To level your plane automatically, press **Ctrl+Alt+5** (that's the 5 on the numeric keypad). Your F-16 will suddenly and miraculously be flying on even keel, rock steady. You can use this autolevel feature at any time short of when you've hit the deck—even if you're going down in a redout spin and you've already reached zero feet. No, it's not realistic. Who cares?

EJECTING

To eject, press **Ctrl+E** three times in *very* quick succession. Your ACES II ejection seat will fire, you'll be blown out through the canopy and up a little way, you'll freefall to 5000 feet, and then you'll find yourself floating gently to earth under your parachute. If you're lucky, in Eject view you'll get a grandstand view of your aircraft going out of control and decorating some available piece of landscape.

Ejecting is obviously a last resort, so use it only when you're in danger of meeting the ground without being introduced first. Try not to eject when your aircraft is inverted (upside down), because you'll be blown out toward the ground. If your plane is rightway up, you can get away with ejecting at zero feet—but in that position you shouldn't need to eject, unless you're running out of fuel (in which case, you should use your remaining fuel to gain as much height as possible before ejecting). Lastly, try to eject over friendly territory if possible.

VIOLATING THE GENEVA CONVENTION

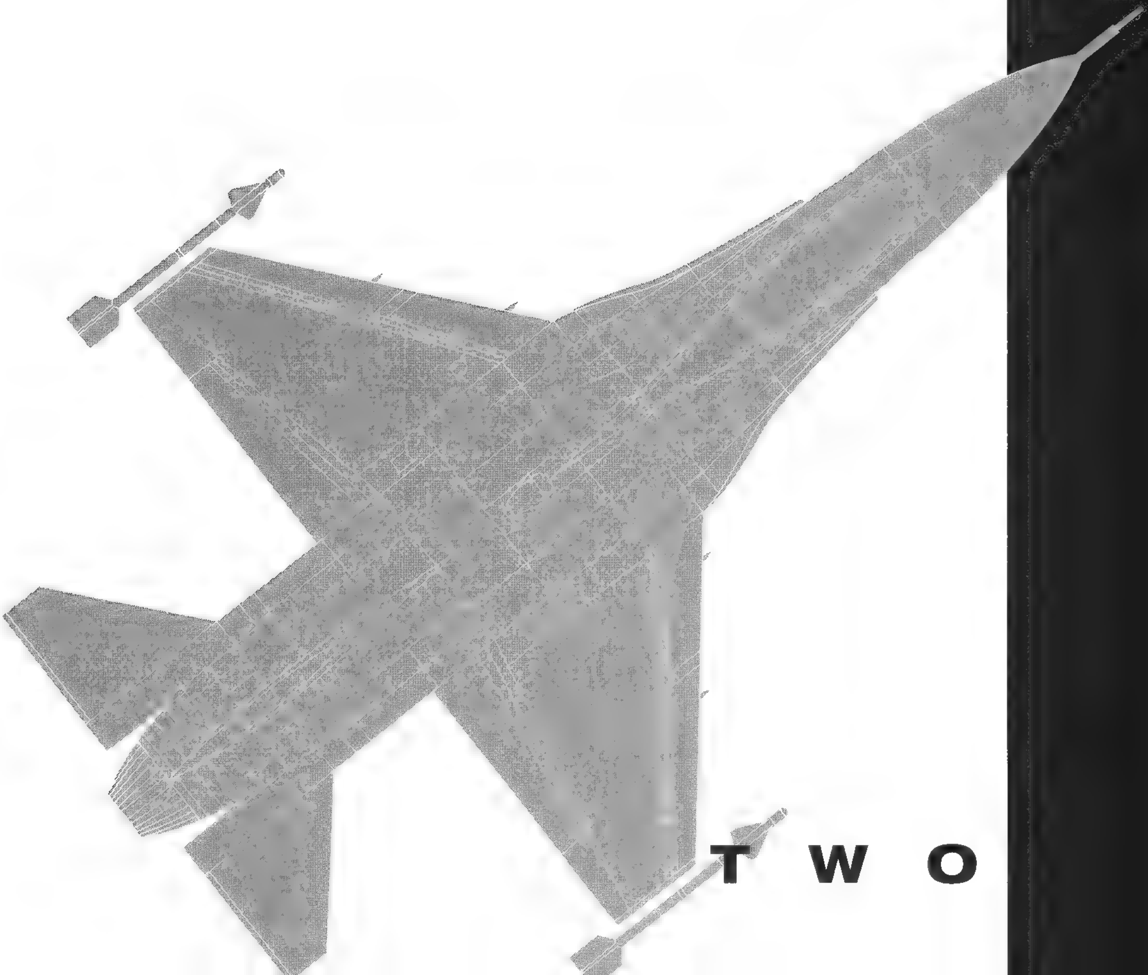
If you're feeling *real* mean, you can strafe pilots who've ejected. If you hit their parachutes, they'll deflate, and the pilots will roman-candle to the ground. Strafing is technically a breach of the Geneva Convention—the international rules governing the treatment of prisoners, the sick and wounded, and civilians during war. Remember the fuss everyone made when it seemed that George Bush, as a pilot in World War II, had strafed survivors in a lifeboat? Same kind of thing. If you're mad or sick enough to try this, bear in mind that in Falcon 3.0E, Operation: Fighting Tiger, and MiG-29, the exact number of occupants that plane carries will bail out when the plane goes down—so if you down an AN-12 Cub, you'll have ten parachuting crew for target practice....

AFTER THE BATTLE

When you die, Instant Action will tell you that the game's over (well, no surprise). Then, if your score is one of the ten highest—and if you've just installed the game, it should be—it'll tell you *That was some shootin', Tex! What's your name?* or an equivalent message of congratulation. Enter your name and press ↵, and Falcon 3.0 will show you a screen with the top 10 high scores. Press **Esc** or ↵ when you've finished admiring yourself.

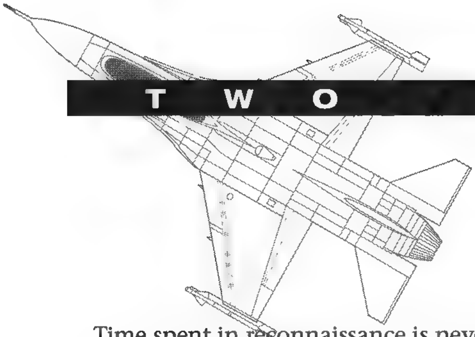
OK, that's it for now. Keep going at Instant Action until you get the hang of things or you feel the urge to move on. When you do... Chapter 5 discusses scoring and tactics in Instant Action. In the meantime, though, we'll look at configuring Falcon 3.0 to different levels of difficulty, what all the other items in the displays are, and how to use the various views and weapons to locate the enemy and destroy him.

FINDING THE RIGHT CONFIGURATIONS



T W O

TWO



Time spent in reconnaissance is never wasted, as Sun Tzu didn't quite say. Now that you've had a taste of Instant Action, I'll bet you're longing to rush into Red Flag training or to start waging war in one of Falcon 3.0's many theaters. But first you need to take a couple of minutes to configure Falcon 3.0 to suit your abilities and aspirations. We touched on this in Chapter 1; here's the lowdown on what those settings you made actually control.

You can configure Falcon 3.0 in two ways: in the Configuration screens or via the menus while playing the simulation. Choices you make in the Configuration screens are permanent, but you can change them temporarily by using the menu options. So let's start with the Configuration screens.

SETTING YOUR BASIC FALCON 3 CONFIGURATION

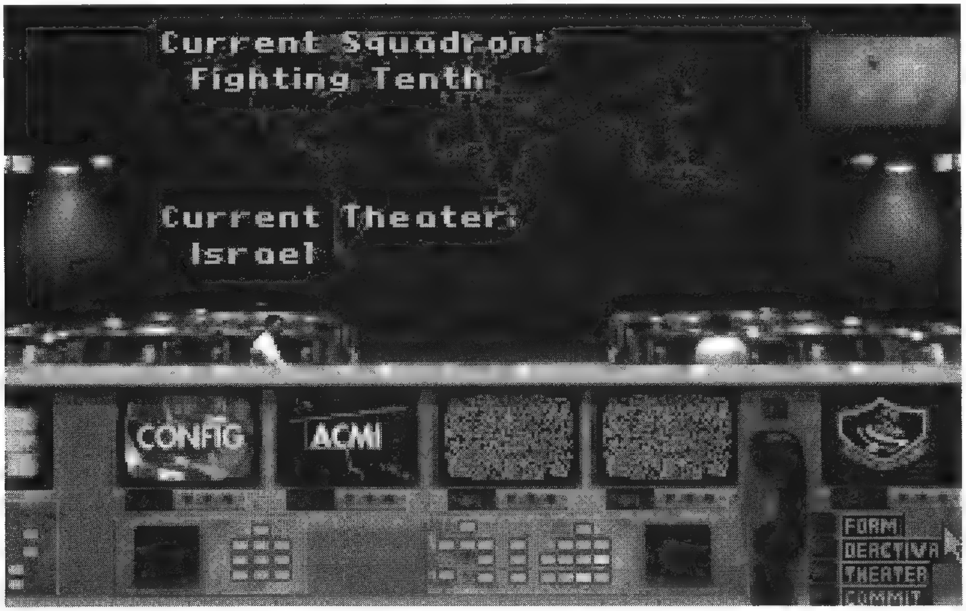
As in Chapter 1, crank up DOS and start Falcon 3.0:

```
CD FALCON3↵
FALCON3↵
```

Hit **Esc** if you want to skip the opening sequence, and again for the credits. You'll find yourself in the War Room (see Figure 2.1).

Click on the CONFIG screen (the leftmost of the four fully visible TV monitors) to reach the Falcon 3.0 Difficulty Levels screen.

As I mentioned in Chapter 1, the Difficulty Levels screen lets you create many custom configurations to suit your skill level and interest. Here's how.



Current Squadron:
Fighting Tenth

Current Theater:
Israel

FIGURE 2.1 *The War Room—the basis for your operations in Falcon 3.0.*

CHOOSING THE RIGHT SETTINGS ON THE DIFFICULTY LEVELS SCREEN

So what settings should you choose for the Difficulty Levels screen? The following sections discuss what the different options affect and suggest strategies for choosing settings that will make Falcon 3.0 challenging but that will allow you to learn without being blown straight out of the sky each time you fly.

Choosing Skill Levels

While you can choose Beginner, Intermediate, or Advanced from the Skill Level list to get a preset list of options, you'll probably do better to set the difficulty levels of each item separately, as you did in Chapter 1. You can't select Custom from the Skill Level list—instead, select one of the other difficulty settings—for example, click on Veterans in the Enemy Logic Level area—and the Custom light will blink on. Then select the other difficulty options one by one.

Choosing the Enemy Logic Level

Here's where you decide the caliber of pilots you'll be facing—Trainee, Cadet, Veteran, or Ace. This is a setting you're really going to feel, so be realistic. Choosing Veteran or Ace when you're starting off will give you plenty of practice eating sand.

The higher the Enemy Logic Level, the faster the enemy will spot you, the faster they'll appraise the situation, the better they'll maneuver, and the more accurately they'll shoot.

Bear in mind that you may want to set different enemy logic levels in Falcon 3.0's different modes. A whole mess of Trainees in Instant Action (where the enemies keep coming until they get you) may be quite enough for you even if you can take out a couple of MiG-29 Veterans in Red Flag.

NOTE

Don't believe the *Falcon 3.0 Flight Manual* when it says that enemy logic levels are incremental, and that if you choose Veteran you'll get pilots of lesser caliber too. Not true. But each enemy logic level comprises a certain amount of variation: Some Veterans are more effective than others, but all Veterans are better than Cadets and worse than Aces.

TIP

Be strategic and set the Enemy Logic Level to Trainee so that you can learn as much as possible about Falcon 3.0 and the enemy.

Choosing a Flight Model

On the Configuration screen, choose from Simplified, Moderate, Complex, and High Fidelity.

The Simplified flight model limits your ability to turn and roll the aircraft; it will give you a different feel from the other flight models because it doesn't register weight or drag influence. If you learn on the Simplified flight model, you're liable to get into bad habits that you'll have to change later.

The Moderate flight model is more realistic, but you'll make better progress by using Complex from the start. With Complex, you'll feel the weight of extra armaments you take on, and appreciate the difference when you get rid of them.

NOTE

You need to have a math coprocessor in your computer to run the High Fidelity flight model in Falcon 3.0. (You don't need a coprocessor for MiG-29 or Hornet.)

WARNING

Your enemies will always be flying with the Complex flight model. This is one good reason to start with Complex and get used to it.

The High Fidelity flight model gives you a sense of momentum that the Complex flight model does not—but the High Fidelity model brings with it a few problems that we'll touch on in a moment.

Problems with the High Fidelity Flight Model

The High Fidelity flight model has a couple of problems you should know about:

- The High Fidelity flight model doesn't work for heavily laden aircraft. If your aircraft is carrying over 32,000 lb., High Fidelity will fly you into the ground. Not good.
- When your speed drops below 250 knots, Falcon 3.0 automatically switches from the High Fidelity flight model to the Complex flight model. This switch can really screw you up in dogfights, when your airspeed may drop below 250 knots just as you're coming in for a kill. You'll get that front-wheel-blowout-on-mountain-curves feeling. Then when you straighten out and start going over 250 knots again, Falcon 3.0 will flip you back into the High Fidelity model, and you'll be hauling your aircraft all over the place until you adjust to the change.

WARNING

One more problem with the High Fidelity model: Airspeed is calibrated differently in High Fidelity than in Complex—you'll find yourself going about 10 percent faster at the same speed! This may ruin your formation flying with computer-controlled aircraft (which, you'll remember, all use Complex).

For these reasons, I'd recommend selecting the Complex flight model from the word go.

Choosing Weapons Effectiveness

Falcon 3.0 lets you set weapons effectiveness (which governs your cannon, iron bombs, unguided rockets, and air-to-ground missiles) to High, Medium, or Low. With Low effectiveness, you have to aim accurately; with High effectiveness, you just have to deliver the weapon within easy commuting distance of the target. Specifically, with Low effectiveness, you need to hit your target; with Medium, 20 feet is close enough; and with High, 40 feet is.

TIP

When you're starting out with Falcon 3.0, set Weapons Effectiveness to High so that you can get some kills right from the start. No point in handicapping yourself.

NOTE

Air-to-ground guided missiles and bombs aren't affected by the Weapons Effectiveness setting—once you lock them onto a target, it's pretty much history. Effectiveness works a little differently for air-to-air missiles: High effectiveness makes air-to-air missiles less susceptible to chaff and flares and more likely to hit their targets from a greater distance; lower effectiveness makes air-to-air missiles more susceptible to enemy countermeasures and maneuvering.

Setting SAMs and AAA

Here's where you set how much damage the enemy ground forces can do to you. SAMs are surface-to-air missiles; AAA is antiaircraft artillery.

Falcon 3.0 gives you five settings for SAMs and AAA: None, Recruits, Reserves, Regulars, and Elites. None turns SAMs and triple-A off completely; the other four settings designate crews that dispense SAMs and AAA with increasing levels of competence. (You can't change the effectiveness of missiles. They don't goof off and forget to check their radar screens.) Recruits will take longer to notice you, aim, lock you up, and shoot you down. They'll also loose off all six SAM missiles at the first enemy they see, leaving themselves vulnerable to a light broiling if they miss him; Elites will apply some strategy and hold back some missiles to see who else comes along needing a fire lit under his tail. Reserves and Regulars fall between Recruits and Elites in skill and strategy.

TIP

For weapons practice early on, turn SAMs and AAA off until you've got the hang of destroying ground units. Then notch up the difficulty level bit by bit.

HUD (Head-Up Display)

The HUD configuration offers you the model A and model C displays. What's the difference? Take a quick look at Figure 2.2 to see the major differences between the two. We'll look at the individual parts of the HUDs in Chapter 3; for now, just some quick guidance on which to choose.

Falcon 3.0 simulates the F-16 model A jet fighter, but you can also choose to see the HUD display of the F-16 model C, part of the F-16 program Multinational Staged Improvement Program phase III (MSIP III). The model C HUD setting shows altitude, speed, and heading on separate displays rather than on the sliding scales of the model A HUD.

While the model C HUD setting is a little less cluttered than the model A version, you may want to stick with the model A HUD for more immediate feedback on your altitude, speed, and heading. And more realism, of course.

Turning Limited Fuel On and Off

Sooner or later you're going to need to learn about managing your fuel, but right now may not be the time (we'll get into such stuff in Chapter 8).

NOTE

The Limited Fuel setting doesn't affect Instant Action—there you always have unlimited fuel and unlimited armament (read on).

When starting Falcon 3.0, consider turning off Limited Fuel so that you can use your afterburners without running out of fuel. Turn Limited Fuel on when you need something else to worry about.

Turning Limited Armament On and Off

TIP

Start with Limited Armament off so you can learn about all the different weapons systems by using them when you need them in the air. When you're ready to pick the right weapons for a mission, turn Limited Armament on. Be ready to make every shot count.

With Limited Armament on, you have only the type and number of weapons that you select in the Armament screen.

With Limited Armament off, you can use all the weapons available in Falcon 3.0. By the way, 99 on the Stores Control Panel (SCP) means unlimited.

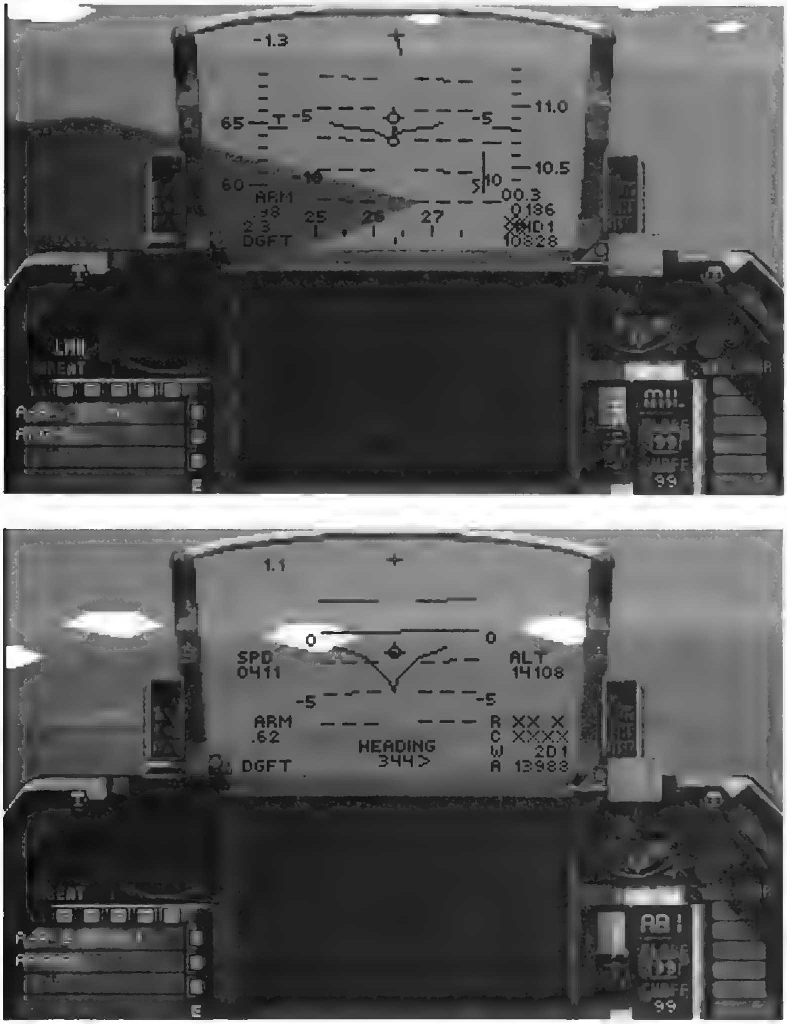
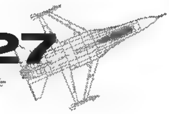


FIGURE 2.2 *The differences between the model A HUD (top) and the model C HUD (bottom)*



WARNING

When Limited Armament is turned off, you still need to load an ECM jammer (for jamming enemy radar) and extra fuel tanks yourself from the Armament screen.

Turning Limited Chaff and Flares On and Off

Your F-16 carries chaff and flares for use against radar and missiles. You can choose Limited Chaff–Flares to restrict yourself to 30 of each. You might want to practice using them against air-to-air and ground-to-air missiles first.

Choosing Radar Modes

Falcon 3.0 simulates the F-16's APG-66 radar, offering three modes:

- Situational Awareness Display (SAD) mode
- Situational Awareness Mode (SAM)
- High-Fidelity Radar (HFR) mode

SAD MODE Situational Awareness Display is a cheat—unlike real radar, which shows only objects in front of the radar dish, this shows everything in a 360-degree circle around your aircraft. Use it to develop your *situational awareness* (SA)—knowing what's going on in the sky around you and how it's going to affect you—for example, who's going to attack you next.

Use SAD mode when you're learning to fly—it simplifies the process enormously. When you're ready, switch to the other radar modes, but be warned—things are going to be *much* more difficult.

SAM MODE Situational Awareness mode is much more realistic than Situational Awareness Display—Situational Awareness mode only shows you targets in front of your aircraft. The main difference between SAM and HFR is that SAM automatically performs some functions that are manual in HFR—but what you gain in ease of operation you lose in precise control over the radar. You decide. Consider starting with SAM and then graduating to HFR.

NOTE

You can't set the radar mode via the menus, so make your choice in the Difficulty Levels screen.

HFR MODE High-Fidelity Radar mode is the most like the real APG-66 radar. You get to set range, altitude, and azimuth scans; you also have to lock up targets manually.

HFR has four modes, which we'll get into in due course (whip ahead to Appendix C if you're feeling really ambitious):

- Normal Air Mode (NAM)
- Situational Awareness Mode (SAM)
- Single Target Track Mode (STT)
- Air Combat Maneuvering (ACM)

Switching Midair Collisions On and Off

If only this worked for cars…! Seriously, though, you'll probably want to keep Collisions switched on. That way you can have a few midair collisions to see how they feel and why you should avoid them. There's a lot of room in the sky, but you can ram other aircraft in dogfights. Kamikaze tactics, indeed. Not recommended.

What happens when you switch Collisions off? You simply fly through the aircraft with whom you would have collided.

NOTE

You can still collide with the ground if you switch Collisions off. In fact, you probably will. But you get to fly through buildings. Go figure.

Switching Redout and Blackout On and Off

Falcon simulates G forces—the gravitational forces you incur when flying (or when cornering in your Viper)—up to and including redout and blackout. Falcon 3.0 simulates redout and blackout quite nicely, as you'll certainly find out if you do the right thing and leave Redout–Blackout switched on. Redout's what you see when pushing too many negative Gs—the blood rushes into your head and some of the tiny blood vessels in your eyes pop. The screen looks like the beginning of one of the Connery Bond movies—*Thunderball, Dr. No,* etc. Blackout's the other extreme—pulling too many positive Gs and draining the blood from your head. Falcon 3.0 simulates this by making the screen go white, then black. Looks like your monitor's gone to the great Video Graveyard Array in the sky, but it ain't so. Just ease up on the acrobatics and the display will miraculously come back—as will your control of the aircraft, which you'll lose when you black out.

WARNING

Falcon 3.0 doesn't quite carry through with the simulation: In Track view (see Chapter 4), you can pull or push heavy Gs without impairing your vision, so the MiG-19s get to pull heavy Gs without turning a hair. If they keep getting you down, try turning Redout-Blackout off. Yes, it's cheating. Yes, you want to win. Yes, do it.

Garnering Intelligence

Intelligence applies only in Campaign—not in Instant Action or Red Flag. Falcon 3.0 offers three levels of intelligence: Perfect, Standard, and Limited.

PER (Perfect) is supposed to display every possible unit in the viewing area; STD (Standard—*not* one of those nasty diseases you keep hearing about) should show most of the units; and LIM (Limited) will show only some. LIM is the most realistic.

WARNING

Even if you set Intelligence to PER, you may not see every SAM and AAA site near targets. Watch out.

When you've finished setting the options on the Falcon 3.0 Difficulty Levels screen, choose the System Setup button to reach the Falcon 3.0 System Setup screen.

USING THE SYSTEM SETUP SCREEN

The Falcon 3.0 System Setup screen lets you choose ten settings that affect how Falcon 3.0 runs on your computer. These settings are largely determined by the power and speed of your computer and the degree of performance you want to get out of it.

Choosing a Flight Control—Keyboard, Joystick, or ThrustMaster

While you *can* control Falcon 3.0 from the keyboard, you'll find you do better with a joystick—unless you can afford a ThrustMaster. A what? A ThrustMaster Flight Control Stick and Weapons Control System is a *very* fancy joystick with a number of extra buttons that you can program to perform different Falcon 3.0 functions. The ThrustMaster works with a HOTAS controller that plugs into a slot in your PC (like a joystick card) *and* into your PC's keyboard port. If you love Falcon 3.0, get a ThrustMaster.

Choosing a Detail Level for Falcon 3's Graphics

Falcon 3.0 offers four Detail Level settings for graphics: Minimum, Medium, High, and Maximum. Which you choose will depend on the speed and power of your computer and the quality of performance you hope to get from Falcon 3.0.

Here are the differences between the Detail Level settings:

Minimum	Shows no 3-D terrain; ground and sky appear flat and monochrome, so you'll find it hard to navigate visually. Use this to get a faster frame rate with a slower computer—for example, for dogfighting.
Medium	Shows some 3-D terrain and a gradient horizon; does not show clouds.
High	Shows more 3-D terrain, a gradient horizon, and clouds.
Max	Shows even more 3-D terrain, a gradient horizon, and clouds.

Set as high a Detail Level as will run with a decent frame rate on your computer. (More on frame rates later in this chapter.) Table 2.1 shows recommendations for the settings to use for different grades and speeds of computer.

TIP

If you find it hard to judge how far away the ground is when using Complex ground texture, use High detail instead.

TABLE 2.1: *Recommended Detail Level Settings for Different Computers*

	Low Detail	Medium Detail	High Detail	Maximum Detail	Terrain On	Horizon On	Clouds On
12-MHz 286	•						
16-MHz 286	•						
16-MHz 386	•						
20-MHz 386		•			•	•	
25-MHz 386		•			•	•	
33-MHz 386			•		•	•	•
25-MHz 486+				•	•	•	•

Choosing Background Sound

Background Sound lets you turn off the Engine and Sidewinder noises, turn one or the other on, or turn both on. If you choose to turn them off (why bother?), you'll still hear wingman and AWACS messages, warning messages, and IFF tones. (We'll get into these in the upcoming chapters.)

TIP

To turn off all sounds—including IFF tones and voice warnings—when flying, select Options ➤ Sound ➤ All Off from the menus. Turning off the IFF makes it hard to tell enemies from friends—though that won't bother you in Instant Action, where you won't be meeting any friends.

Turning Radio Messages On and Off

Falcon 3.0 lets you decide whether to hear radio messages. To turn them off, choose None. If you want to hear them, and you have the 1 MB of expanded memory you need, choose the sound option that you have. I'll give you a hint for free: PC Speaker don't sound too good. If you care for your ears, get a SoundBlaster or local equivalent. (If you're buying a sound card solely for Falcon 3.0, bear in mind that Falcon 3.0 can't use a SoundBlaster Pro's fancy features, so the Pro will sound just the same as a regular 'Blaster.)

Using the EMS Setting

If you've got EMS (Expanded Memory), turn the EMS setting to On so that Falcon 3.0 can load data into EMS memory for faster access and a smoother simulation. If you haven't got extra EMS, consider getting some. (See Appendix A for instructions on configuring your computer to maximize expanded memory.)

Choosing Animation

The Animation setting lets you see or avoid animation sequences that appear in transition areas, such as the pilot getting into his cockpit when you're about to start a mission, or the sequences that appear after a mission in a campaign (for example, you'll see your pilot being buried when you've been killed in action). You'll probably want to turn them off after seeing them a few times.

Getting a Suitable Frame Rate

Falcon 3.0's many options affect the *frame rate* at which it runs. A high frame rate will give a smooth feel to flight. If you set Falcon 3.0 to show more detail, it'll run more slowly. Below certain speeds, it'll get jerky, and you'll find it hard to fly smoothly because of the lag between joystick movement and aircraft response. If this happens, set a lower detail level to increase the frame rate and improve performance.

NOTE

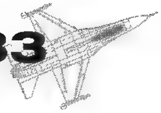
One little surprise: Having a math coprocessor chip won't affect frame rate—Falcon 3.0 uses the coprocessor *only* to implement the High Fidelity flight model.

The frame rate depends on three things:

- how fast your computer's processor is (33 MHz or whatever)
- how complex the current view is
- which options you're running

NOTE

The Detail Level you set in the Configuration screen affects the default setting used each time you run Falcon 3.0, so set it to something appropriate and you won't need to change it too often. When you're running Falcon 3.0, you can use the Options menu to alter this setting.



CHECKING YOUR FRAME RATE

To see what your frame rate is, press **P** to pause Falcon 3.0, and then press **D** to enter debug mode. You'll see a set of numbers in the northwest corner of your screen, like this:

```
1435  210

-00609949  01347107  00020769  00020

00025
```

The last number—00025 in this case—is the frame rate: 25 frames per second. Try different configurations to see if you can improve it.

To get out of Debug mode, press **D** again.

FINE-TUNING YOUR FALCON 3 CONFIGURATION WITH THE MENUS

As mentioned at the beginning of this chapter, you set your default configuration options in the Configuration screen, but you can change a number of them once you're using Falcon 3.0.

Hit Esc to display the menu bar across the top of the screen. To access a menu, click on it with the mouse or hold down Alt and type its first letter—**F** for File, **C** for Control, or **O** for Options.

To get rid of the menu bar, press **Esc** again or choose File ➤ Return to Game.

THE FILE MENU

The File menu lets you end missions or exit Falcon 3.0. Here are its commands:

Return to Game Closes the menu bar and returns you to where you were when you pressed **Esc**. Any other changes you've made from the menus (see below) then take effect.

End Mission Ends the current mission (*duh!*), but the mission will count in your Campaign, and if you're about to buy the farm when you choose File ➤ End Mission, Falcon 3.0 may decide you're already dead. You'll be prompted in case you chose this by accident.

Abort Mission Ends the current mission and scratches it from the record. You may want to choose this rather than End Mission when you pull a wilson (screw up) and stall at zero feet. Again, you'll be prompted in case you were just flailing at the keyboard in desperation.

Replay Replays your AVTR (Air VideoTape Recorder) recording for the current mission. Only works if you've turned your AVTR on and you know how to program it. More on this later.

Quit to DOS Gets you out of Falcon 3.0 and back to the DOS prompt. Guess what—you'll be prompted in case your dog trod on **Esc F Q** while you were fighting.

CONTROL MENU

This is where you recalibrate your joystick when you find yourself flying left wing low, or choose the keyboard as your control for when you break your joystick.

To change your default flying tool, check whichever box is not currently checked—Keyboard or Joystick. If you choose Joystick, you'll be offered the choice of accepting the default setting or recalibrating the joystick.

OPTIONS MENU

Here you can change a bunch of the default parameters you set in the Configuration screen.

Sound This works like Background Sound in the Configuration screen. Choose All Off for no background noise; Engine On for, well, engine noise in the background; Missile Growl (sounds much better than plain old Sidewinder!) for just that; or All On for engine and missile growls.

World Detail This works like the Detail Level setting in the Configuration screen. Choose Maximum, High, Medium, or Minimum. Remember that the more detail you demand, the hotter your chip and the slower your frame rate. Swings and roundabouts.

TIP

To find a detail level that allows a satisfactory frame rate and smooth flight, muck about with the World Detail settings and fly some tests, and then set the victim level as the Detail Level in the Configuration screen. Easier than the other way about.

Terrain This turns on and off the display of topographical terrain. Displaying terrain takes a lot of processing power and may slow down your frame rate to the point that it becomes jerky. If this happens, and you're more interested in smoothness for air-to-air combat, turn off Terrain.

NOTE

If you choose the Minimum World Detail setting and then switch Terrain on, it will switch to Medium World Detail to display 3-D terrain.

Collisions You can choose On or Off to change your Collisions setting in the Configuration screen. Remember, this affects only planes and buildings—you'll still find the ground mighty hard if you get too close.

Change Scale Choose 1×, 2×, 4×, or 8× to display aircraft and moving ground objects at different sizes. 1× is real size, and the most challenging; you'll find it hard to see aircraft outside a couple of miles. To get more warning of the approach of aircraft, set this to 2× (the default setting) or 4×.

WARNING

Choosing a larger scale may let you see aircraft further away, but it doesn't make your radar or weapons any more efficient. (Remember that you can set Weapons Effectiveness to High, Medium, or Low in the Configuration screen to make life easier or harder on you and your targets.)

Clouds Choose On or Off to display or dispense with clouds. Without clouds, Falcon 3.0 will run faster but will be less realistic.

Horizon Choose On or Off to display or not display a gradient horizon. Like clouds, a gradient horizon slows down Falcon 3.0.

To get out of the System Setup screen, click the Done button. You'll be deposited back in the War Room.

NOTE

Remember that you need to have Detail Level set to Medium or higher in the Configuration screen to display clouds or a gradient horizon—Minimum won't display either.

Now that you've got your Falcon 3.0 configuration set, look at Chapter 3, *Mastering the Displays*, for details on how to read the Head-Up Display (HUD) and the Instrument Landing System (ILS).

MASTERING THE DISPLAYS

THREE

THREE

In your first foray into Instant Action, you learned how to read some of the features of your Head-Up Display (HUD) to locate, outmaneuver, and bury your enemies. In this chapter, we'll go quickly through the rest of what you need to know about the HUD. For Red Flag and Campaign, you also need to understand the Instrument Landing System (ILS) mode of the HUD so that you can land without excavating local archaeological sites. First, though, we'll take a quick tour of the Falcon 3.0 cockpit and discuss what's there, what's important, and what you can ignore.

READING THE COCKPIT DIALS

When you start Falcon 3.0, you'll find yourself in the cockpit looking forward (see Figure 3.1). The next sections provide a quick tour of the things around you. Some of these items you met in Chapter 1, but here's a bit more detail.

THREAT WARNING PANEL

The Threat Warning Panel uses two lights to warn you of nearby threats: LCK (Lock-on) and LNH (Launch). LCK flashes when an enemy plane or a missile is locked on to you. LNH flashes when a SAM, a heat-seeking missile, or a radar-guided missile has been launched. Both may flash when a radar-guided or heat-seeking missile is heading your way. We'll discuss how to deal with these in later chapters.

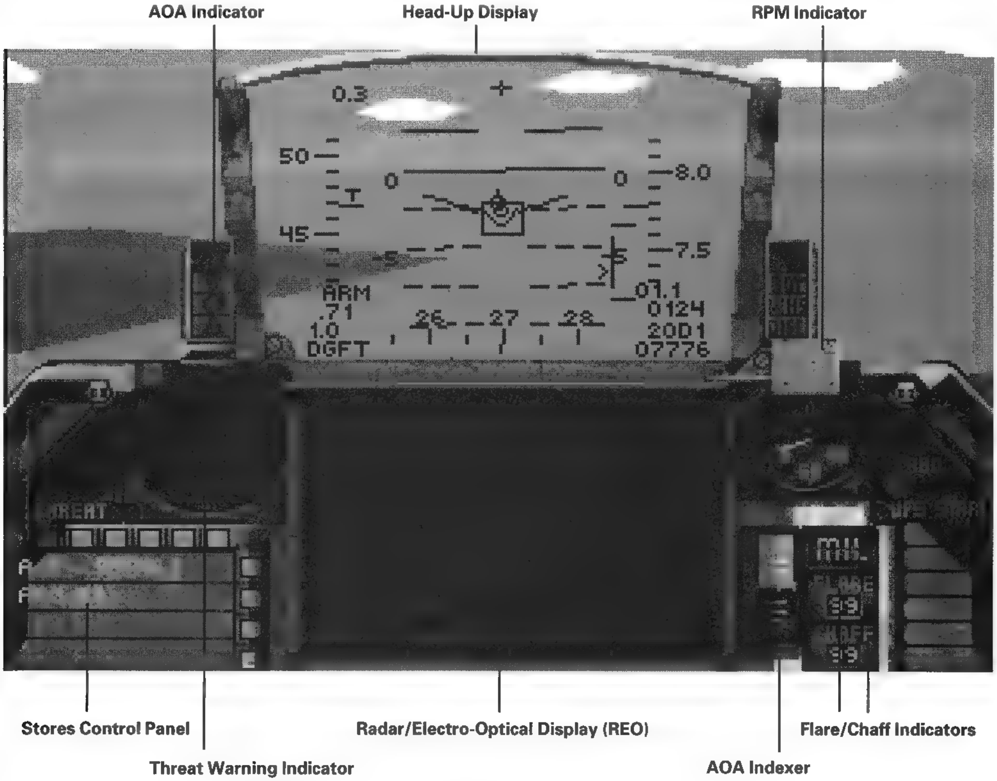


FIGURE 3.1 *The F-16 cockpit*

THREAT WARNING INDICATOR

The Threat Warning Indicator (TWI) shows you enemy aircraft, SAMs, and radar-guided missiles within 30 miles of your F-16. It detects whether you're being tracked by enemy radar—even if you've switched your radar off.

The Threat Warning Indicator tells you:

- **Where the threat is in relation to you:** the TWI displays a marker relative to your aircraft, which is in the center of the TWI.
- **The source of the radar locked on to you:** The TWI displays a ground control radar (for SAM or AAA) as a large rectangle, an enemy aircraft's radar as a diamond, and an active- homing radar-guided missile heading for you as a small square.
- **The type of air-to-air radar used:** 1 for multiple tracking, look-down, shoot-down; 2 for single-target tracking; 3 for continuous wave; 4 for targeting; 5 for attach; and 6 for early warning.
- **The type of air-to-ground radar used:** 1 for continuous wave/doppler; and 2 for pulse-doppler.

WARNING

The TWI only shows aircraft, radar stations, and missiles that have their radar turned on and pointed toward you. If an enemy doesn't have his radar on, or has his radar on but pointed away from you, it won't show up on the TWI, even if it's within the 30-mile limit.

WARNING

The TWI makes no distinction between enemy radar and friendly radar—so when the TWI lights up with a radar signal, don't always assume that it's a bad guy. If you see a missile warning, though, you can safely assume that it's not friendly....

NOTE

In Operation: Fighting Tiger, MiG-29, and Hornet, the Threat Warning Indicator displays strong signals tracking you in the inner ring of the Threat Warning Indicator and weak signals in the outer ring.

STORES CONTROL PANEL

The Stores Control Panel in the lower-left corner of the screen tells you which weapons you're carrying and how many you have left. The top line indicates *A–A* for air-to-air weapon loaded or *A–G* for air-to-ground, followed by the amount and type of weapon, for example *99 SRM*—unlimited short-range missiles.

The second line, APG-66, tells you that your radar is turned on. (Sometimes you may want to turn it off to escape detection.)

RADAR/ELECTRO-OPTICAL DISPLAY

Below the HUD is the Radar/Electro-Optical Display (aka the REO, or simply the radar display) that you use to locate and lock on a target. Here's a brief overview of what it does; we'll get into the details of how to use it in later chapters.

The REO (see Figure 3.2) tells you the following:

Enemy altitude in thousands of feet above terrain level

Enemy heading in degrees

Enemy airspeed in knots

Aspect angle in degrees (the horizontal angle from the tail of the enemy to the nose of your plane)

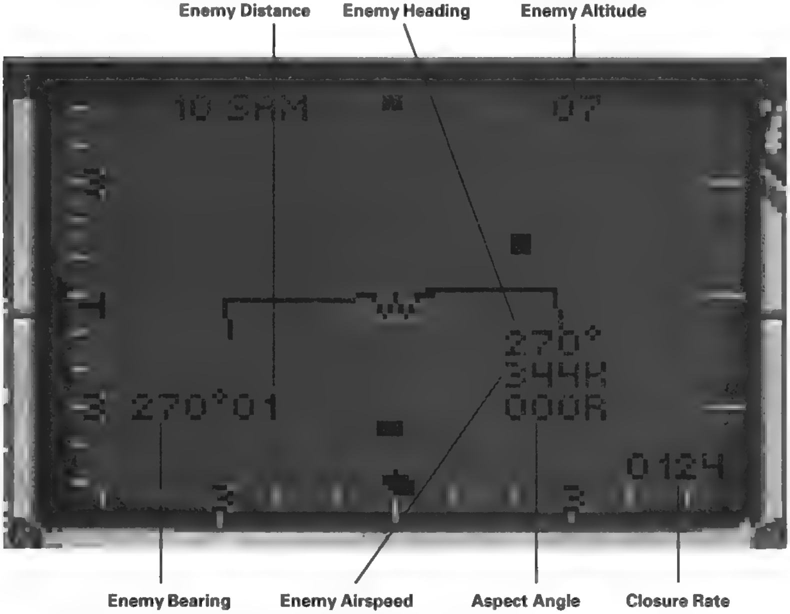


FIGURE 3.2 *The Radar/Electro Optical Display*

Enemy bearing in degrees (the compass direction of the enemy from your plane)

Closure rate in knots—whether you're closing on the enemy (a positive number) or he's drawing away from you (negative). This information is useful when you're pursuing an aircraft.

AOA INDEXER

The Angle of Attack Indexer and Angle of Attack Indicator help you land safely by getting the right angle of attack (AOA). When you've switched on the ILS HUD mode, the AOA Indexer illuminates one of three lights:

- The center circle indicates a perfect angle of approach.
- The upper caret indicates your AOA is too high and your airspeed too low.
- The lower caret indicates your AOA is too low and your airspeed too high.

Adjust your angle of attack until you get the center circle illuminated.

ANGLE-OF-ATTACK (AOA) INDICATOR

Unlike the AOA Indexer, the Angle of Attack Indicator, just to the right of the REO and below the RPM indicator, works for combat as well as for landing. The AOA Indicator shows light blue for a positive AOA, red for a negative AOA. Adjust your angle if it's not what you want.

FLARE/CHAFF INDICATORS

The Flare and Chaff indicators tell you how many chaff packets and infrared flares you have left. Your F-16 will be equipped with 30 of each for any mission unless you've switched off Limited Chaff–Flares in the Difficulty Levels screen, as you did in Chapter 1 (in which case each will indicate 99 for unlimited).

WARNING

Don't rely on flares when you're using your afterburner—you're liable to get a heat-seeking missile straight up your six.

Chaff packets contain strips of foil that confuse radar-guided SAMS and radar-guided A-A missiles. Press **Ins** or **0** on the numeric keypad to loose a packet of chaff.

Flares produce a hot infrared source to confuse heat-seeking missiles. Press **Del** or the period key (.) on the numeric keypad to drop a flare.

RPM INDICATOR

The RPM Indicator indicates the percentage of RPM, or *thrust*, you're applying to your F-16's engine. Press + to increase it, - to decrease it. You can't turn on the afterburner from the keyboard if you've throttled down to idle (below 60 percent RPM)—you need to up the revs first.

READING THE HEAD-UP DISPLAY (HUD)

As you found out in Chapter 1, understanding the head-up display is crucial to your well-being in the sky. The HUD (see Figure 3.3) tells you the following:

- airspeed
- altitude
- heading
- weapons information

If your HUD packs up, you're back aviating with Orville and Wilbur, only in unfriendly skies. Read the following sections to get the lowdown on what the different parts of the HUD do and which to keep your eyes on.

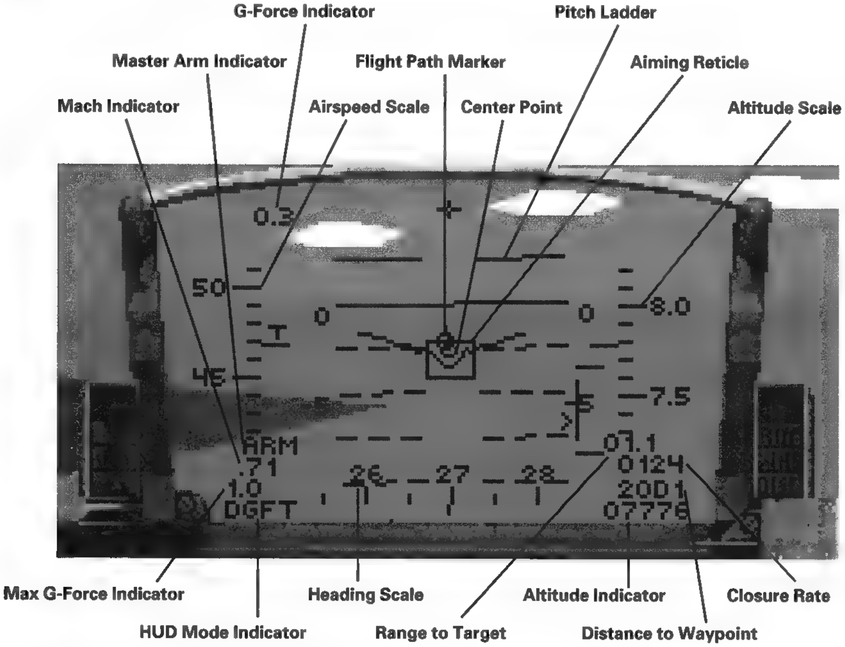


FIGURE 3.3 *The head-up display*

AIRSPEED SCALE

The Airspeed Scale is the ladder of horizontal bars on the left of the HUD, calibrated in 10-knot increments (15 = 150, 50 = 500, 99 = way too fast; slow down at once). The line with the T above it shows your true airspeed (TAS)—that's airspeed adjusted for altitude and air density.

ALTITUDE SCALE

The Altitude Scale is the ladder of horizontal bars on the right of the HUD, showing your altitude in thousands of feet (1 = 1000, etc.). As with the Airspeed Scale, read it at the line. Beware: This is altitude *above sea level*, not above the ground (for that, see *Altitude Indicator* a few sections south of here).

PITCH LADDER

The Pitch Ladder, the horizontal bars in the middle of the HUD, shows your rate of climb or dive in degrees. You'll see solid bars when you're climbing and dashed bars when you're diving—this makes it easier to tell which way you're heading when you're inverted.

HEADING SCALE

The Heading Scale, which you'll see at the bottom of the HUD in Figure 3.3 (and in all air-to-air HUD modes), appears at the top of the screen in air-to-ground HUD modes for better visibility. This measures your heading in 10-degree increments; read it at the line.

NOTE

0° is north, 90° is east, 180° is south, and 270° is west, as any good Boy Scout should know.

Waypoint Caret

The Waypoint Caret, the small ^ below the Heading Scale, shows you the direction to the next waypoint planned in your mission.

FLIGHT PATH MARKER

The Flight Path Marker (the circle with the top three points of a plus sign sticking out of it—see Figure 3.3) shows you the direction in which you are heading when you move the stick.

CENTER POINT

The Center Point (the circle with the point at the top) indicates the middle of the HUD. When you're holding the stick steady, the Flight Path Marker will sit on the Center Point.

AIMING RETICLE

You use the Aiming Reticle, the circle around the Center Point in the middle of the HUD, to target your weapons. Different symbols appear inside the Aiming Reticle when you load different weapons.

MASTER ARM INDICATOR

The Master Arm Indicator displays **ARM** to indicate that your weapons are armed and ready to fire. What's it for? A real F-16 has a Master Arm Switch for arming the weapons, but Falcon 3.0 doesn't. Ignore it.

HUD MODE INDICATOR

The HUD mode indicator appears in the bottom-left corner of the HUD and shows you which weapon system and HUD mode you've selected—for example, **2 MRM** shows you that you've got two medium-range missiles (AIM-120s) selected; **STRF** indicates that you've got M61A1 cannon selected).

G-FORCE INDICATOR AND MAX G-FORCE INDICATOR

The G-Force Indicator tells you how many Gs you're pulling at any given moment; the Max G-Force indicator shows the most Gs you've pulled during the current flight (this is of academic interest only). Gs, as we mentioned in Chapter 2, indicate the amount of gravity currently working on you and your aircraft; nine positive Gs cause blackout, three negative Gs cause redout. You probably won't have time to keep an eye on the G-Force Indicator during combat—just ease off a bit when you start to black out or red out.

NOTE

The latest versions of Falcon 3.0, including Operation: Fighting Tiger, MiG-29, and Hornet, handle G forces much more realistically than previous versions did. As your mission progresses, you'll find yourself getting more and more "tired," and it'll take less and less force to make you black out. Ease off on the heavy maneuvers when you notice you're losing the edge.

MACH INDICATOR

The Mach Indicator is the line above the Max G-Force indicator and shows your speed as a percentage of the speed of sound (Mach 1; about 650 knots, depending on your altitude). How does this help you? Not at all. Ignore it.

RANGE TO TARGET

The Range-to-Target Indicator (the topmost of the four rows of figures in the lower-right corner of the HUD) indicates the distance to the targeted aircraft in miles and tenths of miles. Use it to make sure you fire missiles within their maximum firing ranges (and preferably closer to their optimum firing ranges).

The Range-to-Target Indicator is also useful for keeping tabs on where other aircraft are, since at 1× magnification Falcon 3.0 displays aircraft further than half a mile away as dots, and if you wait till you can sight them before engaging them, you may soon be history.

DISTANCE TO WAYPOINT

The Distance-to-Waypoint Indicator (the second-from-bottom line of figures in the lower-right corner of the HUD) indicates the distance in miles to your current air-to-ground target or next waypoint. That's the number before the **D**; after the **D** comes the number of the waypoint.

ALTITUDE INDICATOR

The Altitude Indicator at the lower-right corner of the HUD shows your altitude *above ground level* rather than *above sea level*, as the Altitude Scale does. Keep an eye on this so that you don't go digging trenches in the wrong places.

USING THE INSTRUMENT LANDING SYSTEM (ILS)

The Instrument Landing System helps you land at runways that broadcast ILS signals without decorating the landscape. It's particularly useful for night landings in Falcon 3.0—or in bad weather in real life. (Falcon 3.0 doesn't give you bad weather yet.)

Press \ to engage the ILS. Instead of the circle in the HUD, you'll see a notched horizontal bar—the Glide Slope Deviation (GSD) bar—intersected by a notched vertical bar—the Localizer Deviation (LD) bar (see Figure 3.4). When landing, you need to align these bars into a perfect cross.

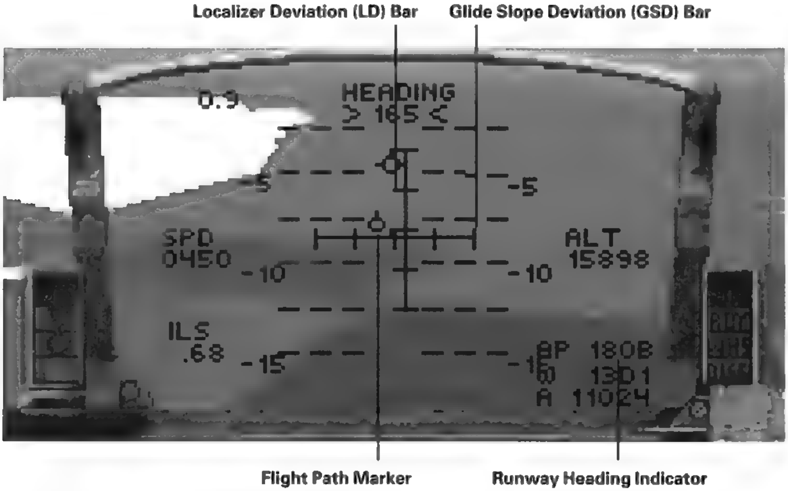


FIGURE 3.4 *The Instrument Landing System HUD mode, showing the horizontal Glide Slope Deviation bar and the vertical Localizer Deviation bar*

WARNING

Approaching a runway too steeply may cause you to crash; approaching at a shallow angle may make you stall.

The Glide Slope Deviation bar indicates whether you're approaching the runway at the right *glide slope* (the correct vertical angle) and is straightforward to use. You need to keep the GSD bar in the middle of the HUD. If it's above the middle of the HUD, you're too low and need to pull up. If it's below the middle of the HUD, you're too high.

The Localizer Deviation bar indicates your angle to the center of the runway. As with the GSD bar, you need to keep the LD bar in the middle of the HUD. If it's to the left, bank to the left; if it's to the right, bank to the right. Make sure you're facing the runway—the LD bar only tells you your angle to it, not which way you're heading. Use the runway heading indicator (see Figure 3.4) to determine the heading to fly to reach the runway.

USING THE DIRECTIONAL ILS MODE IN FALCON 3.0E AND OPERATION: FIGHTING TIGER

The basic ILS system in Falcon 3.0 isn't very realistic, since you can pick up the ILS signal from any angle to the runway, whereas with a real ILS you need to be within a narrow arc (70° at ten miles, 20° at eighteen miles) of the runway to pick up useful signals. Falcon 3.0E and Operation: Fighting Tiger include *directional mode*, a second ILS mode, which is much more realistic.

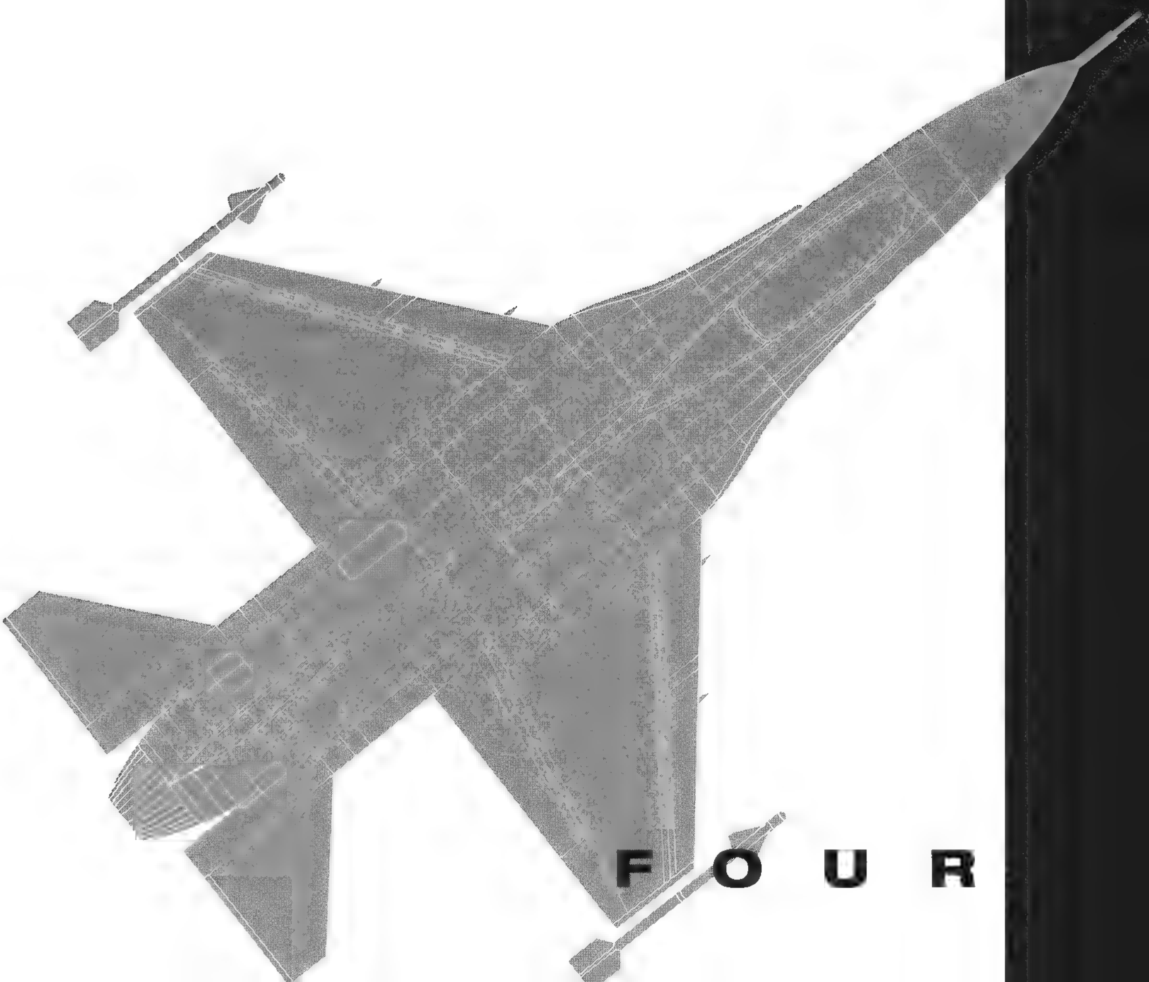
Press **Shift-** to toggle between beacon mode and directional mode. The mode you're in is indicated by the D or B after the runway heading indicator on the HUD.

NOTE

You need to be within 20 degrees of either side of the runway to get valid ILS LD signals.

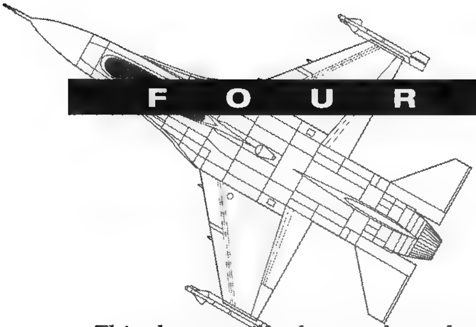
Now that you know what's what in the cockpit, turn to Chapter 4 to learn how to use Falcon 3.0's many views and weapons.

USING VIEWS AND WEAPONS



F O U R

FOUR



This chapter will take you through the different views Falcon 3.0 offers from both inside and outside your plane. You'll learn which views to use in combat and which to use when having fun in the sky.

The second half of this chapter discusses the various weapons you can load on your F-16, how to use them, and what to aim them at.

USING FALCON 3'S VIEWS

Falcon 3.0 gives you a number of different ways to look at your aircraft, both from the inside and the outside. We'll look first at the inside views, because these are the ones you'll be using first when flying your plane.

Practice switching rapidly between the views to give yourself situational awareness—an idea of what's going on around your aircraft.

INSIDE VIEWS

Falcon 3.0 offers five inside views from the cockpit. You can modify these views by pressing Scroll Lock to look up or down.

Front View

Front view (see Figure 4.1) is the view you'll see as soon as you get into the cockpit. You're looking straight ahead and can see the most important instruments: the HUD, the radar, the Threat Warning Indicator, the RPM gauge, and so on.

To engage Front view, press **3** on the keyboard or **1** on the numeric keypad.

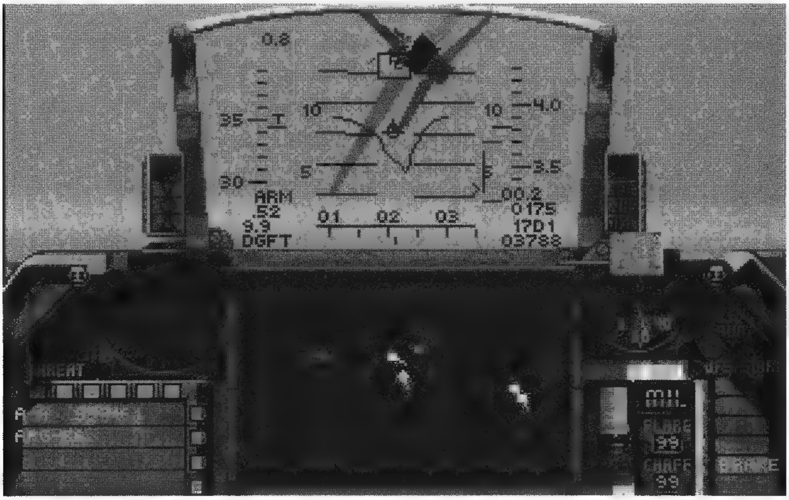


FIGURE 4.1 *Front view*

Use Front view for taking off and landing, flying and navigating, attacking ground targets, and making radar intercepts. For dogfighting, you may find the raised Front view (press **Scroll Lock**) useful when tracking other planes, though Front view doesn't give you the range of vision that Padlock view does.

Left View

Left view (see Figure 4.2) lets you see both the terrain out of the left side of your cockpit and various instruments: the Fuel Indicator, Landing Gear Lights, Air VideoTape Recorder Status Light and Tape Indicator, IFF Light, Backup Airspeed Indicator, and Compass. We'll discuss these as they come up in subsequent chapters.

To engage Left view, press 4 on the keyboard or 7 on the numeric keypad. Use Left view to check your position and your instruments; use raised Left view (Scroll Lock again) to check on your wingmen and track enemy planes. You won't find Left view much use in combat—the view is too limited, and you're looking at the wrong instruments.

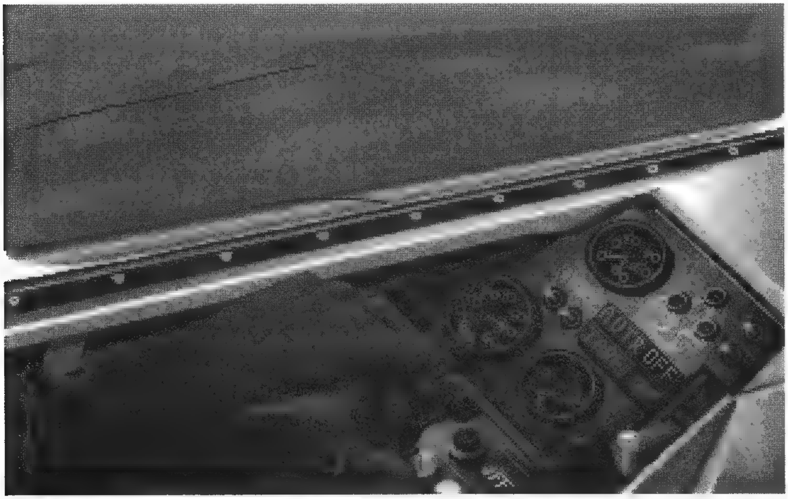


FIGURE 4.2 *Left view*

Right View

Choose Right view (see Figure 4.3) to see the terrain out of the right side of your cockpit and to check the clock (showing mission time) and the Caution Light Panel.

To engage Right view, press **6** on the keyboard or **9** on the numeric keypad.

Use Right view to check your position and to check for damage to your aircraft when you hear a high-pitched tone or a warning message; use raised Right view for checking on wingmen and enemy planes. Like Left view, Right view won't be of much use to you in combat.

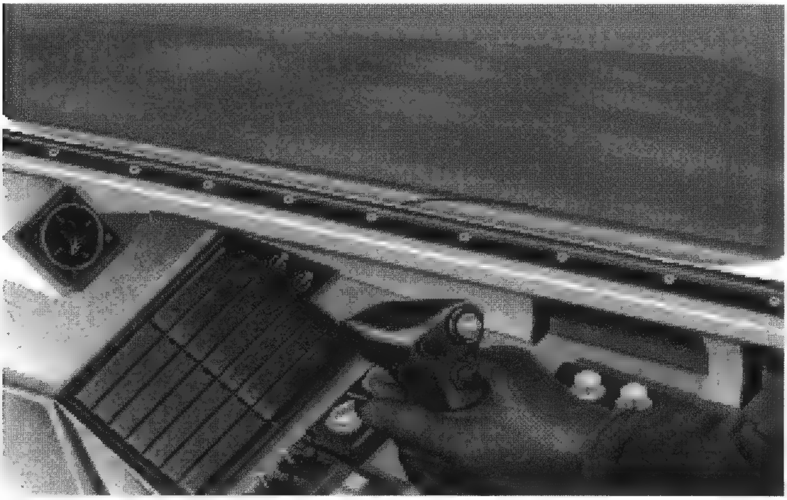


FIGURE 4.3 *Right view*

Rear View

Rear view (see Figure 4.4) shows you the view straight behind you. There are no instruments to worry about.

To engage Rear view, press **5** on the keyboard or **3** on the numeric keypad. You won't see much until you raise the view by pressing Scroll Lock. Use the raised Rear view for checking up on your wingmen and making sure no enemy planes are sneaking up on you.

Up View

Up view shows you the view straight up from the cockpit. If you're upside down, use Up view to see the ground; if you're rightside up, you can use it to check for enemies above you.

To switch to Up view, press **U**. Not surprisingly, you can't scroll Up view up and down, but you can press **Shift+U** to look straight down through the floor of the cockpit (don't ask...).

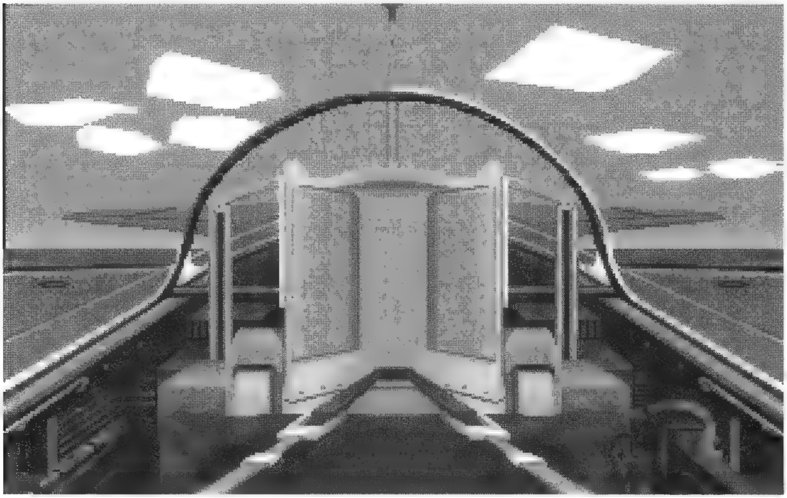


FIGURE 4.4 *Rear view*

OUTSIDE VIEWS

In addition to the inside views, Falcon 3.0 offers the following outside views:

- Track view
- Satellite view
- Ground view
- Wingman view
- Chase view
- Missile, Enemy, and Target views
- Padlock view

In the following sections, we'll look at these views and discuss their uses. Bear in mind that the outside views are not realistic, and that most of them are decorative rather than useful when it comes to combat. We'll get into the details in a minute. First, though, you've got to know a couple of general things about the outside views: how to use the View Status Box and how to zoom and rotate the outside views.

Zooming and Rotating Outside Views

Each of the outside views pops up a box at the bottom of the screen telling you what's what: your Heading, Speed, Altitude, Zoom, and the View you're in. Zoom? Yes—the outside views let you zoom in and out on your aircraft by pressing **F1** and **F2**, respectively. The zoom range is 1 (minimum) to 15 (maximum); 5 is a fairly normal zoom level.

As if zooming about isn't enough, you can also rotate the view around your plane by pressing the keys listed below. Hold down **Ctrl** for finer control.

Rotate clockwise	F3
Rotate counterclockwise	F4
Rotate vertically	Shift+F3
Rotate vertically the other way	Shift+F4

If you want to live, don't do this while someone's shooting at you. Try it out first on the runway while stationary. Vertical rotation will give you some unedifying views of the runway and the sky, but you'll get the principle.

Track View

Track view shows you a fixed view from directly behind your aircraft. In combat, Track view shows you your own plane and any plane you've locked onto. Figure 4.5 shows what you'll see in Track view after scoring a direct hit.

Press **9** on the keyboard to switch to Track view. In Track view, you can get great views by using the zoom and rotate keys. More practically, you can use Track view to get your bearings; and you can use its locking feature to keep the enemy in view during dogfights.

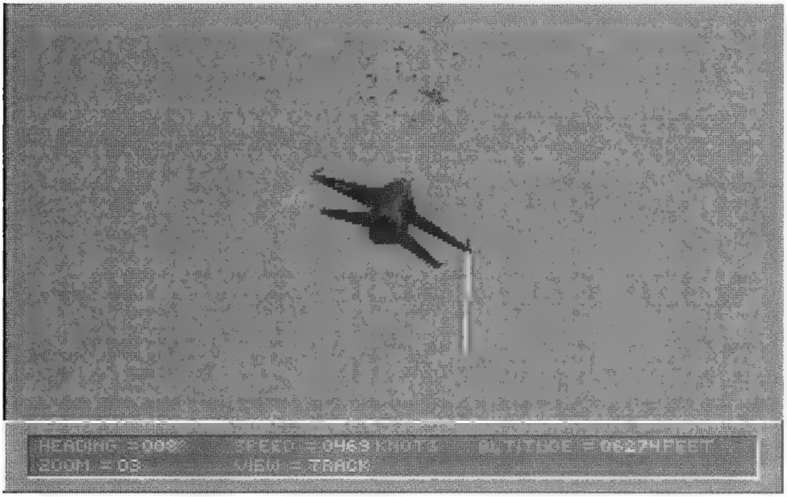


FIGURE 4.5 *Track view shows you your plane from directly behind—and any plane you've locked onto.*

Satellite View

Satellite view shows you your plane from directly above, as shown in the left half of Figure 4.6.

Press **1** to switch to Satellite view. As you'll guess as soon as you look at it, Satellite view won't help you much in combat, but it can help you navigate.

Ground View

Ground view shows you your plane from directly below, as shown in the right half of Figure 4.6. Press 2 to switch to Ground view. You'll usually want to do this for the aesthetic pleasure rather than the practical applications, since there are few of the latter.

NOTE

Another way to get your bearings is to use the Shift+U cheating shortcut that lets you see through the floor of your F-16. A more realistic way to see below you is to roll upside down and use the Up view.

TIP

You can use Shift+F3 and Shift+F4 to switch between Satellite view and Ground view.

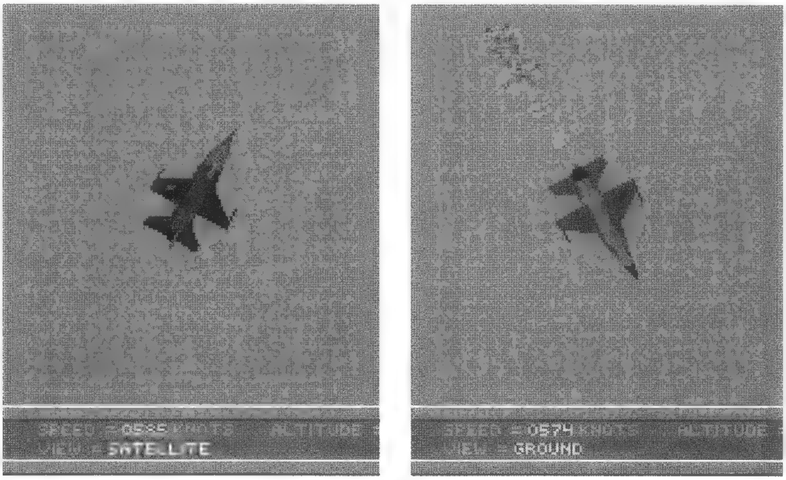


FIGURE 4.6 *Satellite view shows you your plane from overhead—a great way to watch yourself being shot down, but not much else. Ground view shows you the soft underbelly of your F-16.*

Wingman View

On flights for which you have a wingman, you can check the situation out from your wingie's perspective.

Press **7** to check out what your wingman is doing; if you have more than one wingman, press **7** again to reach each subsequent wingman. If one of your wingmen is fighting when you're not too busy, check out what he's doing.

NOTE

This view is not limited to wingmen. If there are other friendly aircraft in the area, this view will let you see them as well.

Chase View

Chase view is like Track view in that it shows you a view from directly behind your F-16, but there's a little lag as you maneuver about. Figure 4.7 shows Chase view.

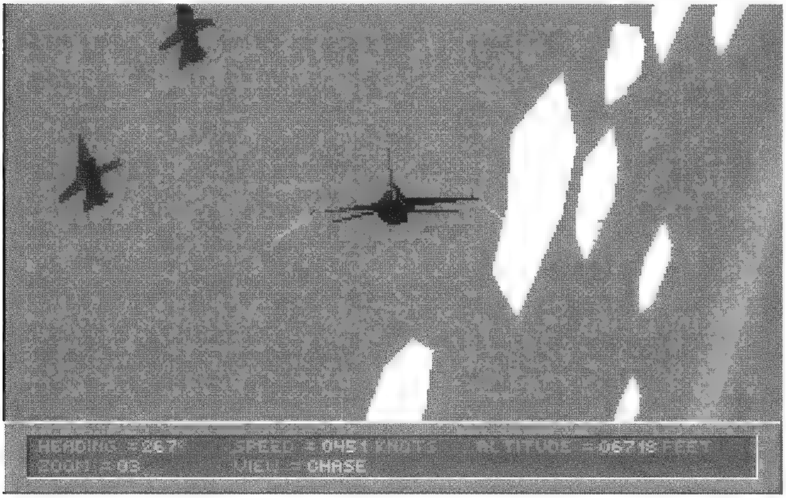


FIGURE 4.7 *Chase view gives you the view from behind but with a little lag as you maneuver.*

Chase view is visually great to fly in unless you get motion sickness; you probably won't want to fight in it unless you're looking to retire soon. More practically, you may want to use it when flying with wingmen to check out what's going on around you all. Press **F3** and **F4** to rotate right and left and see what's happening; Chase view doesn't automatically lock the view onto another aircraft as Track and Padlock view do.

Missile, Enemy, and Target Views

One of the more weird and wacky features of Falcon is Missile/Enemy view, which gives you the view of a missile fired at a target on the ground or in the air.

When you're shooting at an air target, press **Q** to get three views of the target: a view from behind the missile, heading for the target; a view from in front of your missile, looking back at your aircraft while heading backwards towards the target (don't ask); and (best of all) a close-up of the enemy target trying to evade your missile.

When you use Missile/Enemy view on ground targets, pressing **Q** gets you two views: from behind the guided missile (like the TV footage from the Persian Gulf) and from its target looking at the incoming missile. Missile/Enemy view doesn't work with iron bombs—only with guided missiles.

TIP

You can also cheat by pressing Q to get a Missile/Enemy view of an enemy that you've locked up on radar—*even without having fired a missile,* even if the enemy is well beyond visual range. If your ESP's on leave, you might even want to use F3 and F4 to rotate around the enemy and see how many friends are with him.... More legitimately, you can use Missile/Enemy view to see if your missile took out the enemy.

Padlock View

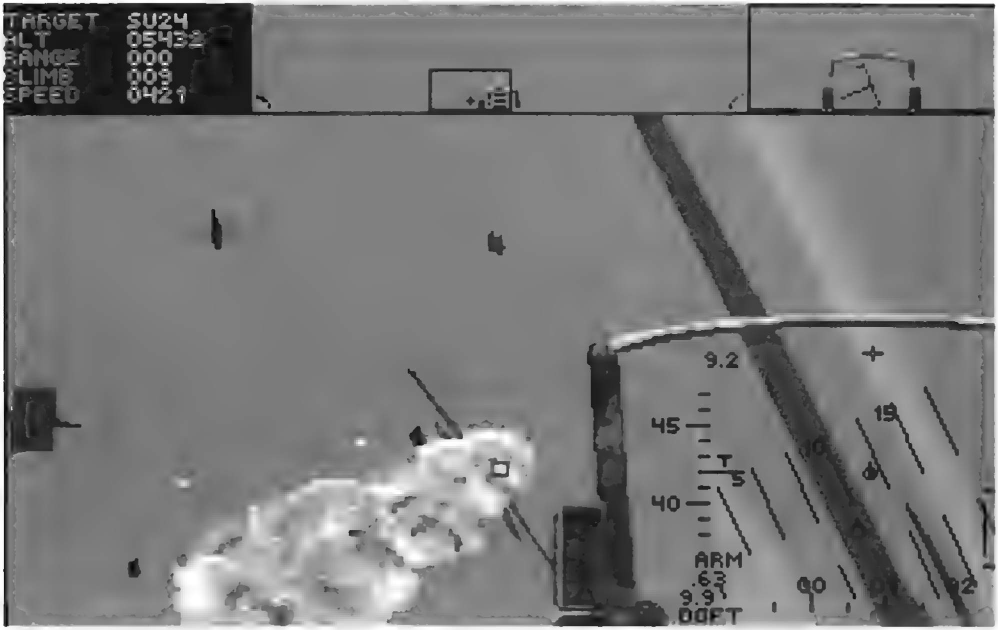
Padlock view is the most useful of the outside views because it gives you the equivalent of a 360° view from inside the cockpit. Figure 4.8 shows Padlock view in action.

Press **8** or the * key on the numeric keypad to engage Padlock view. *Padlocking* is an important skill in dogfighting—keeping your eyes on the enemy so that you never lose sight of him, no matter where you're both heading, and wrenching the plane around to follow your eyes. The F-16's bubble canopy and reclined seat let the pilot see almost 360° around him. In Falcon 3.0, once you've padlocked an aircraft, the view follows it around as if you were turning your head to follow the aircraft.

As you can see in Figure 4.8, Padlock view gives you four windows. The big one, the Main Padlock window, padlocks and tracks the enemy.

On the top, the Padlock Status Window on the left shows you information about your target (here, an SU-24) and its range in miles (here, point-blank), and your altitude *above ground level* (pay attention to this line), true airspeed, and rate of climb.

The 360° Window in the middle shows you where in your canopy the big window is looking. There's a tiny HUD in the center and half of the rear seat on each side. If you've got a targeted plane in sight, as I have here, you'll see a red + sign.



TARGET SU24
ALT 05432
RANGE 000
CLIMB 009
SPEED 0421

FIGURE 4.8 *Padlock view helps you keep your eyes on your enemy at all times—until you no longer need to.*

The Target Locator Window gives you a target locator line and an artificial horizon (here, at an angle to make the Tower of Pisa jealous). Generally, you'll want to follow the direction shown by the target locator line and draw the Targeting Rectangle in to bring your HUD into the Main Padlock window.

Wonderful as it may be, Padlock view has two serious disadvantages that you've got to be aware of before you start your own worm farm: one, you can't see four of the

TIP

That said, Padlock view *does* have priorities. It will always lock onto missiles targeted at your plane first, and *then* lock onto other aircraft in the area, starting with the aircraft closest to your plane. In ILS mode, Padlock view will lock onto the runway if you're close enough and there are no other planes around. You'll find this most helpful in Hornet, as you'll see in Chapter 12.

important instruments in the cockpit; and two, Padlock view will usually padlock your wingmen first.

USING PADLOCK VIEW IN COMBAT

Here are some tips for using Padlock view in combat:

- Use the Target Locator window to track your relationship with the horizon. Padlock view can be very disorientating, particularly at first.
- Use the T key to check out threats.
- Before engaging, make sure that the aircraft you've padlocked is the same one you've locked up on radar. If you've padlocked the aircraft locked up on radar, the box around the aircraft will turn green.
- Use missiles rather than guns in Padlock view because of the way the HUD moves about. Use the HUD to aim, lock, and fire your weapons as usual. There's one thing to watch out for here. When an aircraft flies below and in front of you, Padlock view won't raise the HUD to block your view as it logically should. In other words, if you were flying a real F-16 and trying to padlock a plane that flew below and in front of you, you'd end up trying to look through your feet, and of course you wouldn't be able to see it. Padlock view will show you this plane *as if it were still visible to you*, but you won't be able to target it (it's really out of the range of your weapons) and you may lose any missile lock that you had on it.
- Use Padlock view rather than Rear view to check for attacks from behind. Padlock view lets you see all angles to the rear whereas Rear view only shows you directly behind you. Your six is a sensitive and vulnerable area! Watch out for pairs of MiGs with one acting as bait and the other as the trap snapping shut on you.

When you're in Padlock view, switch back to Front view regularly to do the following:

- Check your Threat Warning Indicator to see if anyone's locked you up. (You'll still hear the LCK and LNH tones, but those won't tell you who's coming to visit.)
- Check your throttle settings so you don't stall.
- If you appear to be losing power and the enemy's pulling away from you like a Ferrari from a Suburban, check that you haven't left your speed brakes on—there's nothing in Padlock view to tell you.
- Check your ECM status light to make sure you're not hanging out a red flag to all the MiG-29 bulls in the neighborhood.

How do you avoid padlocking your wingmen? Well… you can't avoid it: If they're flying in close formation, Padlock view will padlock them first. Here are two strategies to deal with this deficiency:

- As soon as you switch to Padlock view, press **T** once for each wingman after the first to see any real target—if you have three wingmen, press **T** twice.
- Use the Target line in the Padlock Status Window to check what you've got padlocked—you'll recognize aircraft more quickly this way than visually.

OVERVIEW OF VIEW KEYS

Here are the keys for switching between the various views:

Key (keyboard)	Key (keypad)	View	Inside/ Outside
1		Satellite	Outside
2		Ground	Outside
3	1	Front	Inside
4	7	Left	Inside
5	3	Rear	Inside

Key (keyboard)	Key (keypad)	View	Inside/ Outside
6	9	Right	Inside
7		Wingman	Outside
8	*	Padlock	Outside
9		Track	Outside
0		Chase	Outside
Scroll Lock	Scroll Lock	Cockpit up/down	Inside
U		Up	Inside
Q		Target/Missile/ Enemy	Outside

USING FALCON 3'S WEAPONS

In Chapter 1, you learned to use Falcon 3.0's air-to-air weapons in a satisfyingly straightforward way—blazing away at anything in sight and seeing what happened. That works well for your first few times in Instant Action, but you'll need a little more subtlety for Red Flag and Campaign. This section discusses how to select the different weapons in Falcon 3.0 and what you should use each for.

SELECTING WEAPONS

As we mentioned in Chapter 1, your F-16 carries air-to-ground and air-to-air weapons. The type of weapon currently loaded appears on the Stores Control Panel to the left of the REO: A–A for air-to-air, A–G for air-to-ground, and after that the type of weapon—AIM9M for AIM-9M Sidewinders, DGFT or STRF for the M61A1 gun, etc.

Use **Backspace** and ↵ to switch between the two categories of weapons and then again among the various types of each. Press **Backspace** to switch to air-to-ground weapons; press it again to switch between the four types of air-to-ground missile and six types of bomb. Press ↵ to switch to air-to-air weapons; press it again to switch between the three air-to-air missiles and the M61A1 gun.

To fire a weapon, press the trigger button on your joystick or the spacebar on the keyboard.

TIP

You should also be able to run through the different air-to-air and air-to-ground weapons by pressing the second button on your joystick.

USING THE AIR-TO-AIR HUD MODE

So far you've learned to read the major features of the HUD. Now we get to the HUD items that change depending on which HUD mode you're in and which weapon you've got selected. Figure 4.9 shows how the HUD looks in air-to-air mode.

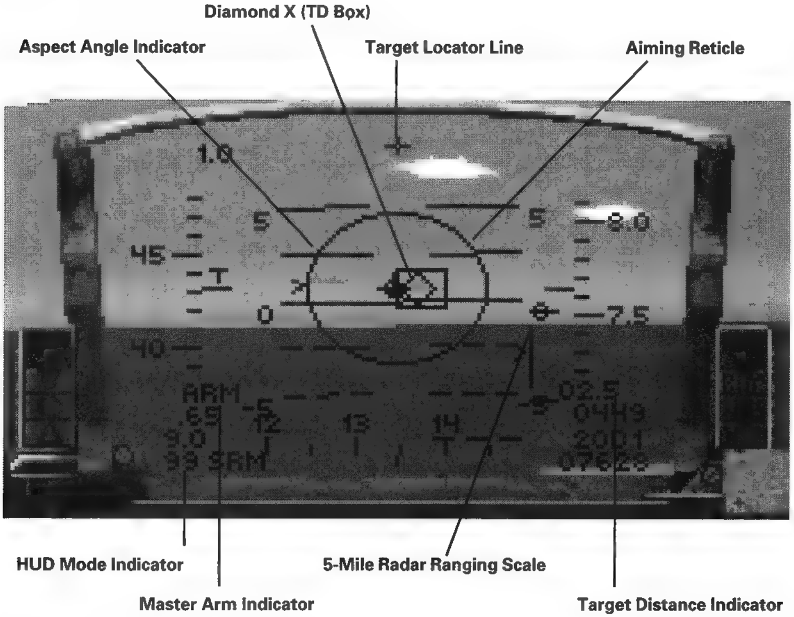


FIGURE 4.9 *The HUD in air-to-air mode*

Aspect Angle Caret Shows the aspect angle reading from the REO—the angle between the tail of the enemy aircraft and the nose of your plane. The caret appears at 12 o'clock to indicate a 180° aspect angle, at 3 o'clock for a 90° left angle, at 6 o'clock for a 0° angle, and at 9 o'clock for a 90° right angle. To figure out the direction quickly, read the caret as the way the enemy plane is heading relative to your plane.

Master Arm Indicator Ignore this (in Falcon 3.0, your weapons are always armed).

HUD Mode Indicator Shows which weapon is selected and (for missiles) how many you've got left. You'll see SRM for AIM-9P or AIM-9M missiles, MRM for AIM-120 missiles, or DGFT for the M61A1 gun. You may find it quicker to look at the HUD Mode Indicator than the Stores Control Panel for this information.

Target Locator Line Leads from the small + sign at the top of the HUD towards the target.

Target Distance Indicator Shows the distance to the target in miles and tenths of miles.

Target Designator Box Shows where your current target is (even if the target isn't yet visible), provided it's within the display range of the HUD. If the target is in front of you but off to one side, the Target Designator Box will appear as a Diamond X until you bring the diamond into the HUD.

5-Mile Radar Ranging Scale This vertical bar appears when you're within five miles of the enemy. The caret moves downward as you approach the enemy, from five miles (the top of the bar) to zero (the bottom).

Aiming Reticle Try to get your target into this circle in the center of the HUD. The Aiming Reticle flashes to indicate a missile lock on the target. You'll see different sizes of Aiming Reticle for the three air-to-air missiles: minute for the AIM-9P, medium for the AIM-9M, and big for the AIM-120. These sizes indicate the *kill circle* for the missiles. The larger the Aiming Reticle, the easier to hit the target.

Missile Seeker Head With AIM-9M missiles, the diamond representing the seeker head will move around the screen until it locks onto a target; the seeker head for the AIM-9P or AIM-120 stays in the center of the HUD.

Before we get into the specifics of each weapon, you need to know how to select targets using the Target Select Key and how to use the Identification Friend or Foe device.

Using the Target Select Key

In Falcon 3.0, you can easily switch between multiple targets. Press T to toggle between targets within radar range and establish which is most dangerous to you (and which you should therefore engage first). This strategy works for both air and ground targets.

Who Goes There—Friend or Foe?

Another thing you need to know about for when you get serious with Falcon 3.0 is the Identification Friend or Foe (IFF) device. You use the IFF to make sure you don't off friendly planes by mistake. Before you launch a missile, press **N**. If the oncoming plane is a good guy, the IFF will squawk at you; for a bad guy, you won't hear anything.

CHOOSING AND USING THE AIR-TO-AIR WEAPONS

Your F-16 can carry three types of air-to-air missiles. Here are the differences between them and their uses:

AIM-9P Sidewinder This rear-aspect heat-seeking missile must be fired at the back end of an enemy plane. It's relatively cheap and so is widely available in campaigns. Its small Aiming Reticle makes it hard to lock onto a target—and you need to get the Target Designator Box inside the Aiming Reticle to get a lock. Its effective range is supposed to be 6 miles, but you'll have trouble locking anything up at over 4.7 miles.

AIM-9M Sidewinder This all-aspect heat-seeking missile can be fired at any part of the enemy. It has a larger Aiming Reticle than the AIM-9P, so it's easier to lock onto a target—but it's more expensive and not so widely available in campaigns. Its effective range is supposedly 6–10 miles, but it's hard to lock anything up at over 4.7 miles. With the AIM-9M, you don't have to get the Target Designator Box within the Aiming Reticle as long as you're pointing in the right direction.

NOTE

You're lucky to have the AIM-120—most of the enemy planes don't have BVR missiles. Only the MiG-29, the Su-27, and the Mirage fighters can be equipped with similar missiles. Use this advantage to take out enemy aircraft before they can even threaten you.

AIM-120 Advanced Medium Range Air-to-Air Missile (AMRAAM) This is a radar-guided missile with a large Aiming Reticle. You can fire it from beyond visual range (BVR). It's very expensive, so it's not widely available, and almost useless at close range. It'll go 30 miles.

Locking Up and Firing

When one of your Sidewinders locks onto a target, its growl will turn to a high-pitched whine and the Aiming Reticle will flash. The AIM-120 makes neither noise, but the Aiming Reticle will flash. Press the trigger or hit the spacebar to fire the missile.

Using the M61A1 Gun

You learned to use the M61A1 gun in Instant Action in Chapter 1, but here's just a quick recap. When you switch to the M61A1 gun, you'll see the Aiming Funnel, two curving lines that meet in the middle of the HUD. Shells from the M61A1 gun should end up at the point of the funnel. Try to get the enemy plane within the funnel and let fly in short, controlled bursts. Gun ammunition is relatively cheap and plentiful; the range of the M61A1 gun is 1 mile, but don't expect to hit anything unless it's within a half mile.

WARNING

You may find that your shells wind up in the wide end of the funnel rather than at the point. Adjust your aim accordingly.

USING THE AIR-TO-GROUND HUD MODE

The first thing you'll notice about the air-to-ground HUD modes is that the Heading Scale appears at the top of the HUD rather than at the bottom. This is so that you can see the aiming cue, which tends to be at the bottom of the HUD in air-to-ground HUD modes.

NOTE

You'll see the Target Distance Indicator in some air-to-ground HUD modes.

The HUD Mode Indicator shows the following air-to-ground modes:

CCIP	Mk82/82HD/83/84 iron bombs, CBU-84 cluster bomb, LAU-5003A rocket launcher
E-O	AGM-65B missile, GBU-15 guided bomb
A-R	AGM-45A and AGM-88A anti-radiation missiles
I-R	AGM-65D missile
DUR	BLU-107/B demolition bomb

CHOOSING AND USING THE AIR-TO-GROUND WEAPONS

The next sections give details on the various air-to-ground weapons that your F-16 can carry: air-to-ground missiles, bombs, and rockets.

AGM-65 Maverick Missiles

Falcon 3.0 offers two types of Maverick: the electro-optical AGM-65B for use during the day and in good weather and the infrared AGM-65D for use at night or in bad weather. Unfortunately, through a glitch in the programming, Falcon 3.0 fails to distinguish between the different uses—so unless you're feeling hyperrealistic, use either at any time of day.

A second glitch is that each kind of Maverick is supposed to have a range of 12 miles—and they do when your wingmen use them. But when you try the Mavericks yourself, you won't be able to lock onto a target outside about three miles. To get around this, engage your autopilot to fire the Mavericks for you at longer ranges.

Use the Mavericks against trucks and tanks; they're not so effective against buildings.

To fire a Maverick, aim the crosshair at your victim, wait for its image to appear in the REO, and then press the trigger. These are fire-and-forget missiles—you can start looking for another target as soon as you've fired them.

Anti-Radiation Missiles

The two anti-radiation missiles, the AGM-45A Shrike and AGM-88A HARM missiles, are for taking out radar installations and mobile radar units.

Use the Shrike against continuous-wave radar, which is used by almost all enemy defense systems (the SA-8 Gecko SAM uses pulse-doppler radar). The Shrike is relatively cheap and plentiful; its range is 12 miles.

The HARM, which you can use against both continuous-wave radar and pulse-doppler radar, is expensive and hard to get in campaigns. Its range is 30 miles.

When you load a Shrike or HARM, your crosshair will automatically track the nearest radar target. Again, fire by pressing the trigger or the spacebar.

WARNING

Shrikes suffer the same problem as Mavericks in Falcon versions before 3.01—with manual control, you can't lock up targets outside three miles—but this was fixed in Operation: Fighting Tiger. If you're using a version before 3.01, either get in close or let your autopilot do the shooting for you.

TIP

Continuous-wave radar will show up in the Threat Warning Indicator as a 1 or 3 in the SAM rectangle; pulse-doppler radar will appear as a 2. Use a Shrike or a HARM accordingly.

CHOOSING AND USING THE BOMBS

That's quite an array of missiles we've just been through, but we're not done yet—you still need to know about the six types of bombs your F-16 can carry. You'll be relieved to know that you drop all bombs the same way, just on different targets. Here's what's for what:

Bomb	**Uses**	**Comments**
Mk82 iron bomb	Infantry and light armor	Plentiful in Campaign. An F-16 can carry 24 Mk82s.
Mk82HD Snakeye	Infantry and light armor	Has fins to slow the bomb's descent so you can use it at low altitudes without needing surgery afterwards.
Mk83 iron bomb	Buildings, POL (petroleum, oil, and lubricant) tanks, railroad shelters	Heavy—each weighs 1000 lb. Load Mk83s only when you need them.
Mk84 iron bomb	Large buildings, power plants, bridges, protected aircraft hangars.	Very heavy—2000 lb. each. Load Mk84s only when you really need them.
CBU-84 cluster bomb	Infantry, light armor	Each cluster bomb contains 200 bomblets that disperse over a wide area. Don't release CBUs lower than 475 feet.
BLU-107/B Durandal	Runways	Buries itself in the runway before exploding so as to cause maximum damage.

Dropping Bombs

Falcon 3.0 uses the Continuously Computed Impact Point (CCIP) method to make bombing straightforward. With CCIP, you designate a target and then release the bombs.

With bombs selected, your HUD will display a Bombsight (a circle and dot) at the bottom and a Displayed Impact Line, the vertical line above the Bombsight (see Figure 4.10). Line up the Bombsight (aka "death dot"!) on a target and press the spacebar to designate the target. The displayed Impact Line will extend all the way up the HUD and a horizontal Time Impact bar will appear in the top half of the HUD (see Figure 4.11). As you keep flying straight and level, the Displayed Impact Line will move down the HUD; when it reaches the Center Point, the bombs will drop.

NOTE

***Rippling* is dropping multiple bombs on a single target. See the ripple number on the Stores Control Panel—the R*nn* number? That shows how many bombs will drop at once. Press ' to increase the number by twos and ; to decrease it.**

Alternatively, you can press the spacebar to drop the bombs. This requires a great deal of skill and doesn't confer any particular advantages.

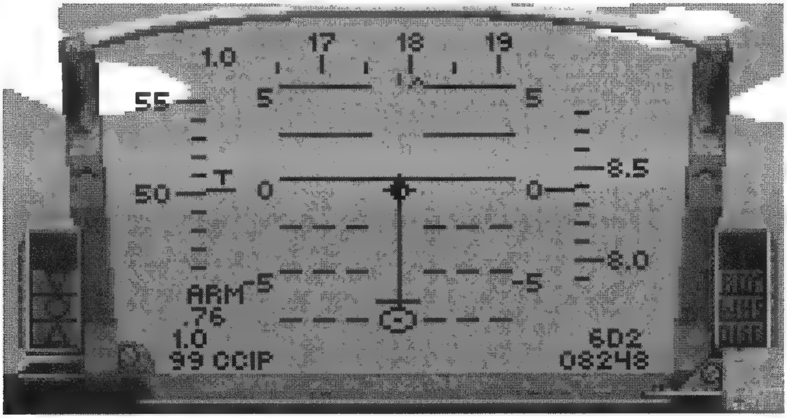


FIGURE 4.10 *The Bombsight and Displayed Impact Line on the HUD*

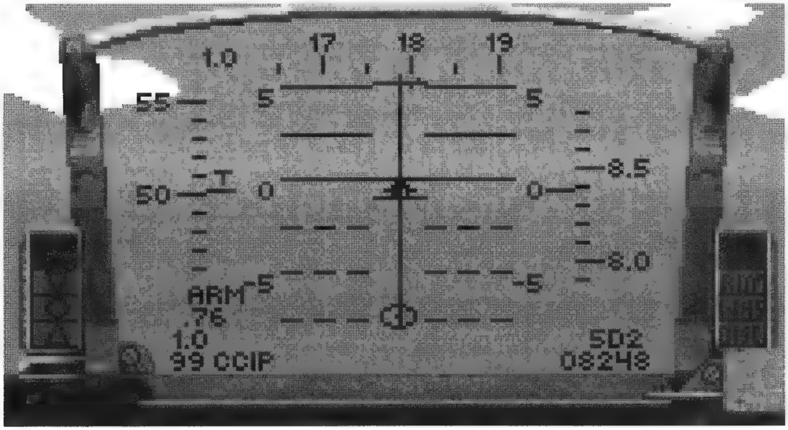


FIGURE 4.11 *After you press the spacebar to designate a target for the bombs, the Displayed Impact Line extends up the HUD and the Time Impact Bar appears in the top half of the HUD.*

Launching Rockets

Your F-16 also has a rocket launcher—the LAU 5003A—that uses pods containing 19 rockets each. Use these against light armor, infantry, trucks, and jeeps. When you select the LAU 5003A, you'll see a fixed bombsight in the middle of the HUD. Point the bombsight at the target and press the trigger or spacebar.

Strafing with the M61A1 Cannon

Generally speaking, you'll only use your M61A1 cannon for air-to-ground attack when you've run out of the other weapons, although it can work well against infantry. To use it, switch to the cannon, line up the gunsight on your target, and press the trigger or spacebar.

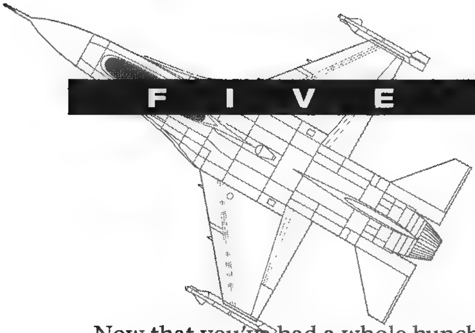
WARNING

In air-to-ground modes, always keep tabs on your airspeed and altitude. It's easy to forget about them while lining up a target, and you can end up digging a big hole for yourself right next to your ground target if you aren't careful.

That's it for views and weapons. I'll bet you've had enough theory for the time being and you're longing to get back into action. So go do it—fire up Instant Action and let loose with the different weapons. Then read Chapter 5 to learn about strategies for Instant Action and how scores are determined.

SCORING AND TACTICS IN INSTANT ACTION

FIVE



FIVE

Now that you've had a whole bunch of theory, it's time to get back into Instant Action. This chapter will help you increase your lifespan and improve your rating in Instant Action; we'll discuss specific tactics for Instant Action and general dogfighting tactics that you can apply to Instant Action.

First, though, let's look at what the scoring in Instant Action means, how it's done, and how you can maximize your score as quickly as possible.

SCORING IN INSTANT ACTION

At the end of Instant Action, you'll have seen the score screen showing the planes and tank-objects that you knocked out and the number of missiles you used on them, together with a score apparently conjured out of thin air. Here's a quick run-through of where the score really comes from.

On the score screen, aircraft icons represent aircraft you've destroyed in the air or caused to crash (for example, if you destroy an aircraft's engine, it will crash; more on this in a minute). Tank icons represent destroyed *runtime map objects*—objects created when you start Instant Action—such as tanks, armored personnel carriers, the American Automobile Association, and SAMs. The destruction of anything permanent—bunkers, runways, bridges—only counts toward your satisfaction in destroying it.

NOTE

On the score screen, you won't see an icon for every plane or ground object once the screen is full, but everything you destroy *will* count toward your score. Don't be greedy.

TIP

Yup, you guessed it. If you're going for high scores, don't waste time and munitions shooting up buildings and bridges that don't give you points. Shoot at the runtime map objects that'll count for you. But when you run across some vital sucker of a bridge on one of your low-level sorties, don't even hesitate—hit it with whatever's going. That's the beauty of Instant Action—you've got Mavericks coming out of your ears, and you might as well use them.

The missile icons on the score screen show the number of missiles you fired to notch up all those kills.

So that's what the icons stand for. *Now* where do the points come from, and why don't you have more already?

FALCON 3'S SCORING FORMULAS FOR INSTANT ACTION

Falcon 3.0 has a couple of *complex* scoring formulas for Instant Action. First, here's the scoring formula for air-to-air:

```
score = (damage × base score × skill × number of enemy aircraft
visible) – (number of AA missiles fired) × 5
```

Well, thank Loki that's clear! Here's what those terms mean:

Damage is what you inflict on the enemy:

- Beyond-visual-range kill: 1
- Non-fatal damage (enemy can still fly): 1
- Enemy flies into ground: 2
- Enemy blows up: 3

Base score is a points value for the enemy you destroy, rated on a scale of danger from 10 to 60:

- **10** An-12, IL-76
- **20** Tu-22
- **30** Su-24, Su-25
- **40** MiG-19, MiG-21, MiG-25, Mirage III, MiG-27, SA-342, MiG-24
- **50** Mirage F1, MiG-23, Mirage 5
- **60** MiG-29, Su-27

Skill Level depends on the current Enemy Logic Level.

- Trainee: 1
- Cadet: 2
- Veteran: 3
- Ace: 4

Number of enemy aircraft visible is those within five miles.

NOTE

The Enemy Logic Level starts off at the level you set in the Configuration screen (you've forgotten already? Look back to Chapter 2). Once you destroy the first wave of aircraft, you'll move up to the next level—if you started with an Enemy Logic Level of Cadet, you'll move up to Veteran; if you take out the wave of Veterans, you'll move up to Ace. Each wave contains fourteen aircraft—twelve fixed and two random. More random aircraft will appear if you don't destroy the twelve fixed ones in short order.

Well, that was straightforward enough, especially for those of us who recalculate our income tax every morning while waiting for the coffee to cool. But the scoring formula for air-to-ground targets is somewhat screwed. It's *supposed* to be:

```
Score=1000 × number of enemies within visual range
```

That's enemy *aircraft* in visual range, not ground forces—you deserve points if you're taking out ground targets while under fire from enemy aircraft.

You'll find that you don't get the full 1000 points for *every* runtime map object you take out, but that you still score more for knocking out tanks and ground forces than for knocking down aircraft.

TACTICS FOR INSTANT ACTION

As you learned in Chapter 1, Instant Action gives you unlimited fuel, unlimited weapons—and unlimited enemies. The aim of the game is to stay alive as long as you can, take out as many of the enemy as possible, and rack up your highest possible score before you find yourself eating lead. Here's how to go about it.

TAKE OUT THE WELCOMING COMMITTEE

Each time you enter Instant Action, you'll meet the welcoming committee of the four Tu-22 bombers and two Su-25 ground-attack aircraft (see Figure 5.1). Dispose of these six as fast as possible. Get the Su-25s first—they're mean and they've got all-aspect infrared missiles that they won't hesitate to fire at you—and then take out as many of the Tu-22s as you can. Watch out for the Tu-22s' rear-mounted machine guns—they can rearrange your teeth at a mile and a half.

After the four Tu-22s and the two Su-25s, your enemies are created at random, and you won't be able to predict any of the action. So make the most of the welcoming committee—you should quickly develop your tactics for dealing with the Tu-22s and the Su-25s, because you'll meet them every mission in Instant Action. Use the welcoming committee to gird your loins for battle.

TIP

Remember that you can use Shift+T to change the time of day if you find yourself flying in unsuitable conditions—for example, in the dark.

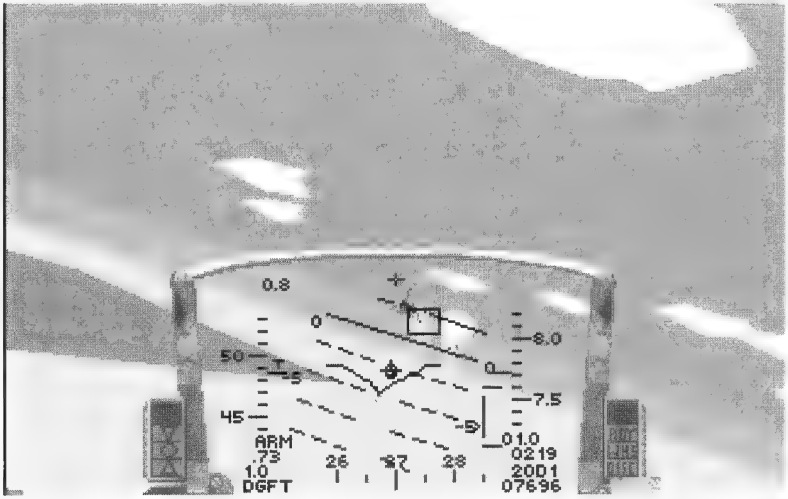
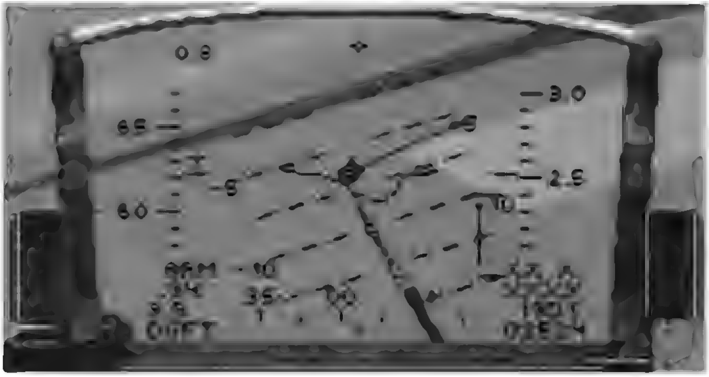


FIGURE 5.1 *You'll meet the welcoming committee every time you enter Instant Action, so get used to dealing with them quickly.*

HIGH-RISK ALTERNATIVE SCORING STRATEGY: TAKE OUT THE CITY

If you're feeling brave (or foolish), you can rack up high scores by not attacking the welcoming committee but using them as live visible enemies to increase your score while you shoot up ground targets.

The moment you get into Instant Action, hang a right and head for the white area (see the illustration coming up in a second), select your AGM-65Bs or AGM-65Ds—remember, these two work the same in Falcon 3.0, even though they shouldn't—and let loose at every ground target you see. Watch your back for unfriendly company, and watch the ground for SAMs and AAA—unless you've had the forethought to turn them off.



If you don't feel like taking so many risks, deal with the welcoming committee and then head for either the city or the island—both contain goodly numbers of ground targets.

USE THE RIGHT WEAPONS

Blowing an enemy aircraft to bits with your cannon from close range is about the most fun you can have in Instant Action, but don't try to make all your kills that way. Use your unlimited weapons to take out enemies as soon as possible. Located an enemy beyond visual range? Loose off a pair of AIM-120s as soon as you can lock him up. An enemy outside cannon range? Send him a couple of AIM-9M Sidewinders by express delivery.

Once you've reduced a wave of enemy aircraft to one or two, then you can allow yourself the luxury of going for a guns kill. But don't try to be cute when the skies are full—the enemy isn't going to buy into any real-men-don't-use-missiles bull. In Instant Action, the wise pilot will use whatever weapon he needs to keep the enemy off his six as long as possible.

TIP

You're penalized only five miserable points for each missile fired, so fire plenty of 'em—you'll bring down more enemy aircraft that way, and if you hit anything, you'll hardly feel the penalty in your score.

TIP

Large aircraft like transports can take a lot of punishment. Unless you need plenty of target practice and there are no MiGs around to nail you, use missiles rather than the M61A1 gun to take out transports.

WHEN THINGS GET TOO HOT

When life in Instant Action becomes too entertaining and you can't see blue sky for the MiGs thronging you, cut and run. Slap on full burner, yank the stick back, and climb to a decent altitude—say 30,000 feet—where there's less company and you can figure out where you're at. After a while, some enemies will come after you, usually in pairs. This way, you can practice dealing with manageable numbers of the enemy before plunging back into the melee.

PRIORITIZE YOUR TARGETS

This sounds like corporatespeak, but it applies in the air too. When you're surrounded by bad guys, make sure you kill the worst guy first. For example, never go after transports when there's a MiG-29 in the vicinity—the 29 is a mean mother (with all-aspect infrared missiles and a top speed of Mach 2.3) that could kick your F-16's six given half a chance.

Don't wait about to interview a MiG-19 either, because it'll probably be able to outmaneuver you.

Use the Target Select key (**T**) to switch between the targets within range and identify the most dangerous one; then engage him first and take him out before proceeding to easier meat.

PADLOCK MISSILES AIMED AT YOU

You can padlock missiles in Padlock view, Track view, and Wingman view. Press **8** for Padlock view, **9** for Track view, or **7** for Wingman view, and the view will set you looking at the missile. It may be too far away for you to see it, but you'll be able to tell the direction it's coming from.

Padlock view will show you the type of missile on the Target line in the Padlock Status Window (see Figure 5.2).

Once you've padlocked a missile, take evasive action—change course, pump out flares and chaff, and so on. You may want to use Track view so that you can see how well your evasive maneuvers work. If you're lucky, you may see a missile hitting your flares or chaff and exploding.

One word of warning: Once you press **T** to switch to other targets, you will be able to padlock the missile again only by switching to Padlock view, Track view, or Wingman view.

TIPS FOR SUCCESSFUL DOGFIGHTING

Every dogfight you get into will turn out differently, but here are some general steps to put yourself in a winning position from the beginning.

- Locate the enemy and keep sight of him. Remember the fighter pilots' maxim: "Lose sight, lose the fight." The moment you lose sight of your enemy in a dogfight, you're in severe trouble. Start by using your radar in Forward view to locate enemy planes. In Instant Action, you don't need to check your IFF before doing anything precipitous, but you want to get into the habit of checking the IFF when flying in Red Flag and Campaign.

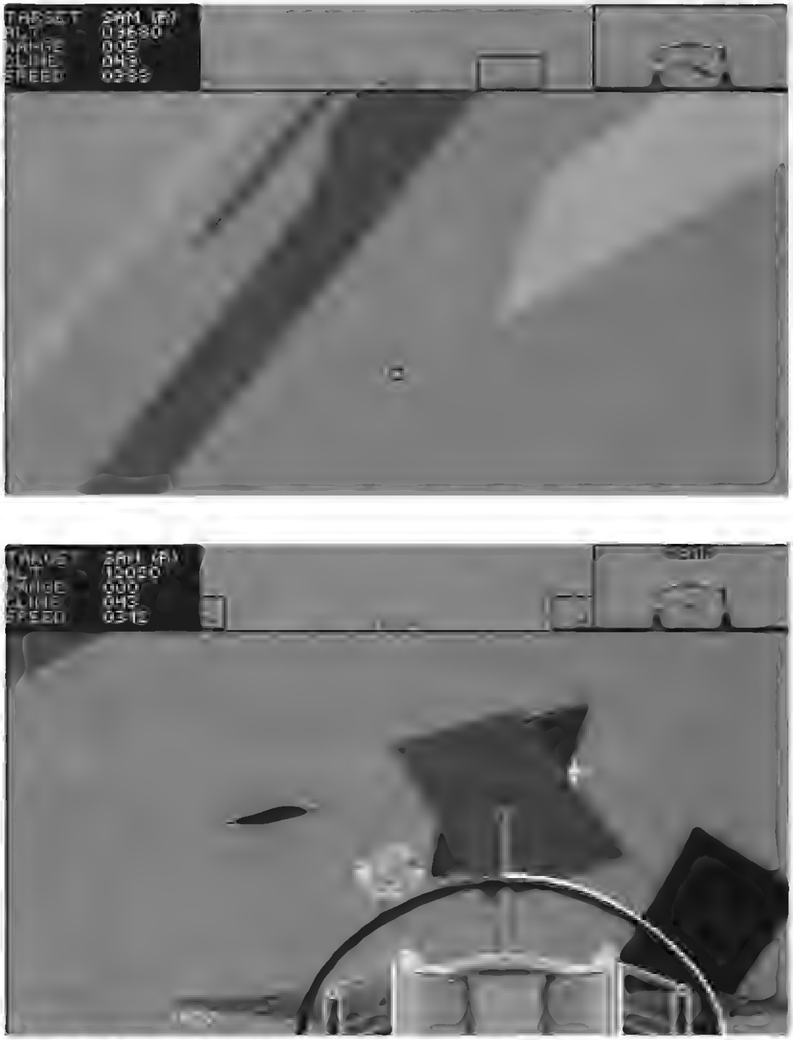


FIGURE 5.2 *Use Padlock view to identify the type of missile coming at you (top)—and then take evasive action before it's too late (bottom)!*

- If you locate an enemy beyond visual range, fire a couple of AMRAAMs at him.
- If you locate an enemy closer to you, use Padlock view to identify the aircraft—you should be able to get an identification at about six miles.
- If you can't get a grip on an enemy in Padlock view, try switching to Track view, which will give you a clearer view of where you are in relation to him. Use the **T** key to lock up the enemy you're after. If there are several aircraft within range, Track view may lock up the wrong ones first. Keep pressing **T** until you find the enemy you want, and then bring the nose of your aircraft to bear on the enemy. Switch to Forward view (press **Scroll Lock** to scroll up in Forward view and see more of the sky), lock the enemy up, and fire.
- For a visual identification, try using the **Q** view.
- If you lose the enemy while in Forward view, switch back to Track view to reacquire him.

TIP

Once you graduate to the High Fidelity Radar mode, use HFR to get a good distance view of what's happening around you.

"SPEED IS LIFE": KEEP YOUR ENERGY HIGH

It's easy to lose track of your own airspeed when you are trying to keep your eyes on the enemy. There's no worse feeling than rolling out of a 7-G turn behind a MiG only to have him pull up into the vertical and leave you in the dust without enough airspeed to follow him.

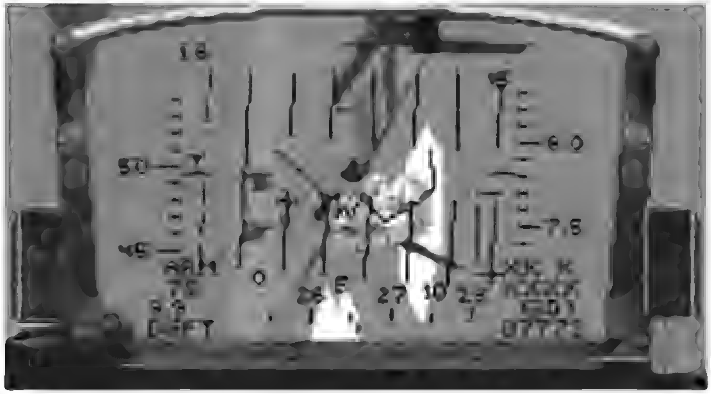
Try to keep your airspeed close to 400 knots (the F-16's best cornering speed) in a dogfight. If you get into a turning fight and you see your airspeed falling off, drop your nose a bit and convert some altitude to airspeed. You don't want to find yourself floundering just above stall speed, because you can be sure the enemy will find you at just the wrong moment and knock the, er, *stuffing* out of you.

- Use the Target Designator Box on your HUD to keep sight of enemy planes if you start to lose them against the background.
- If you lose the enemy in the sun, remember that you can change the time of day (and thus shift the sun) by pressing **Shift+T**.

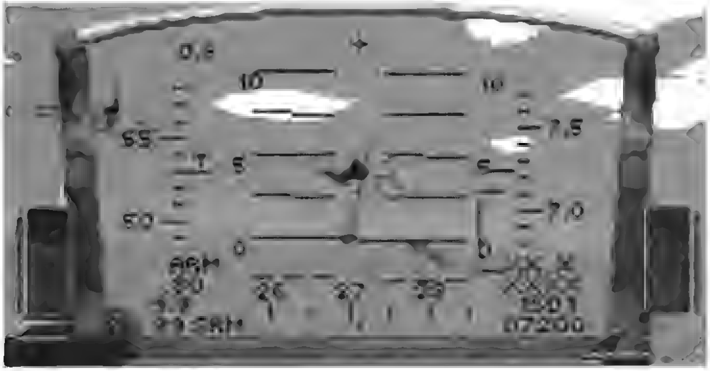
HOW BADLY HAVE YOU DAMAGED THE ENEMY?

So you fired at the enemy and hit him. How badly is he damaged? Do you need to finish him off, or can you leave it to time and gravity to do the job? Here are the four levels of damage Falcon 3.0 shows and what they mean.

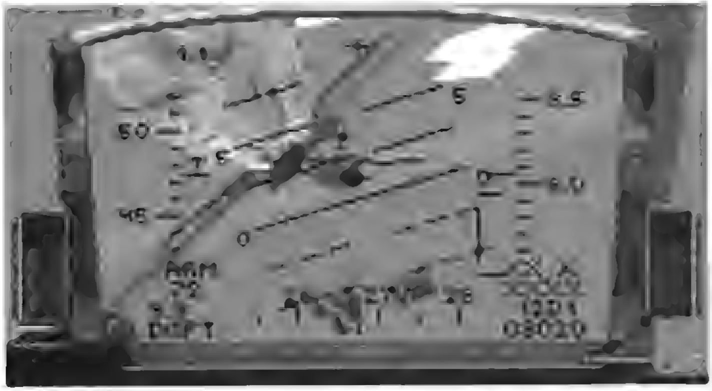
- **Pieces** flying off the aircraft indicate minor damage. Some aircraft systems may go out—for example, you might shoot out his fuel system or his ECM jammer, so he can no longer use them. This won't incapacitate the enemy enough for your purposes, so keep shooting!



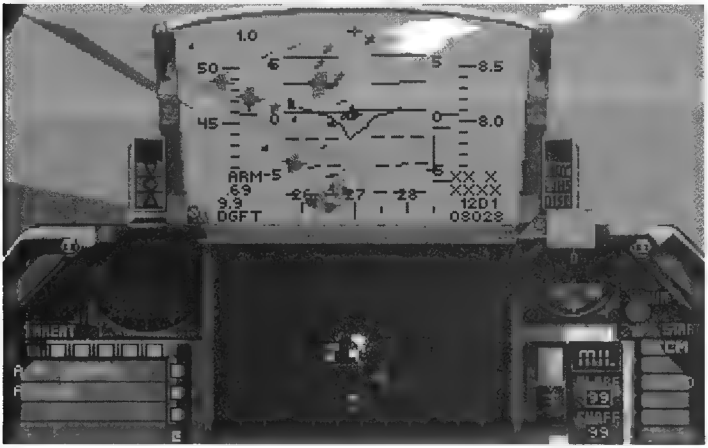
- **Smoke** pouring from an aircraft means you've damaged his engine so that it no longer works. Bear in mind that *his weapons may still be working*, and he can use any altitude he has to keep flying downward. Don't get in front of him; stay behind him and finish him off. Alternatively, get clear of him and leave him to go down—any plane with smoke pouring from it is going to crash.



- **Flames** coming out of an aircraft mean you've knocked it out, and it's going down out of control. Rejoice briefly and find another target.



- If the aircraft **explodes**.... Three guesses, and congratulations! You probably hit the fuel tank. Now find something else to shoot at.



USING INSTANT ACTION FOR STRATEGIC TRAINING

Instant Action's the best place to practice the skills you learn in the other areas of Falcon 3.0. As you work your way through the next chapters, come back to Instant Action for the following, as well as for dogfighting practice:

- **Guns practice**. (Set a low Enemy Logic Level to start with.)
- **Air-to-ground weapons practice**. Once you've cleared the skies of aircraft for the time being, switch to air-to-ground weapons and practice using them on ground targets. Don't get so wrapped up in bombing and strafing that you forget to watch your six—another wave will be along shortly.

- **Landing practice**. If you're desperate for entertainment, you can try landing at the enemy air bases. Try to knock down all the enemy aircraft first.

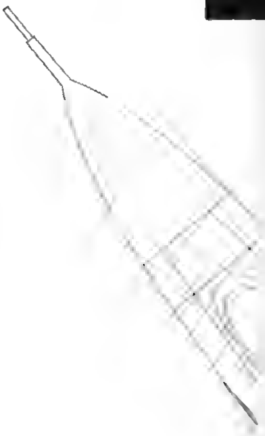
NOTE

The M61A1 gun fires *6000* rounds of 20-mm cannon a minute. A full load is *515* rounds—about five seconds' worth! In Instant Action, use your unlimited ammunition to improve your shooting to the point that you won't waste ammo when it counts (in Campaign). Fire in short, controlled bursts, and watch where your shells go.

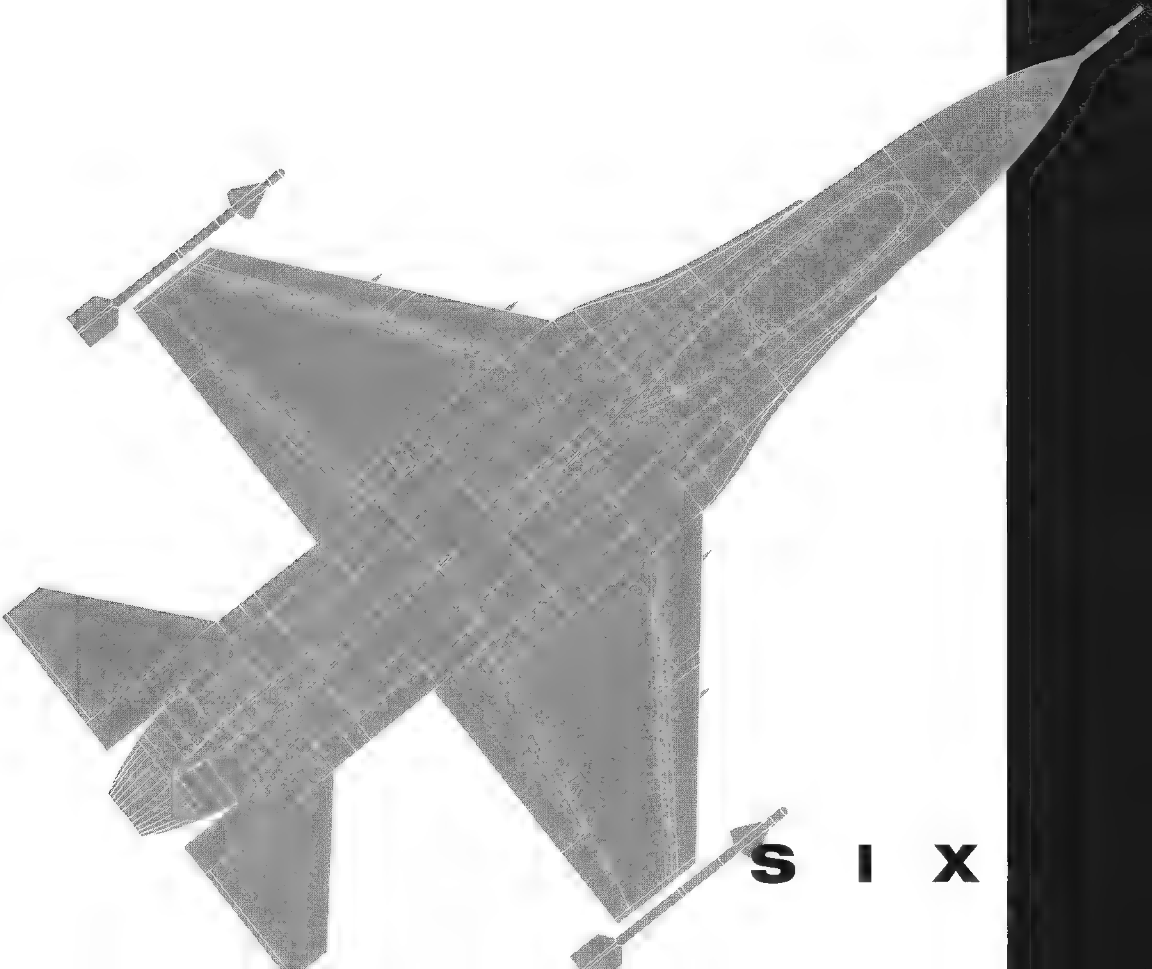
That's about it for Instant Action. It's Falcon 3.0's most accessible module—you can be up in the air and fighting for your life within thirty seconds of booting your computer. And it's great for sharpening your reflexes and honing your skills on the edge. Right now, though, it's time to get serious. Hoist the Red Flag....

PART TWO

RED FLAG



WELCOME TO RED FLAG



SIX

SIX

Before a pilot gets to fly his F-16 in combat, he needs a whole bunch of training. You're lucky—you can skip the many months of training, fire up Instant Action any time you want, and study air combat in the school of hard knocks. For more formal training in flying, though, you need to use Red Flag, Falcon 3.0's training area. This chapter will introduce you to Red Flag and what you can do in it.

WHAT IS RED FLAG?

Red Flag is the second of Falcon 3.0's three major modules; Instant Action, which you've already met, was the first, and Campaign (which we'll deal with in Part 3 of this book) is the third. Red Flag is a training ground and mission editor where you can prepare yourself for combat and learn and practice vital flying skills.

Falcon 3.0's Red Flag is based on the annual Red Flag training exercises held at Nellis Air Force Base, Nevada, where a Blue Team of pilots from around the world takes on a Red Team of experienced pilots who mimic the tactics of enemy air forces.

NOTE

Red Flag contains a number of preset missions to teach you the elements of flying. When you've been through these, you can build your own missions to develop your skills in aerial combat and bombing. Chapter 7 discusses the preset missions; Chapter 8 shows you how to build your own.

CREATING AND JOINING SQUADRONS

Before you can do anything in Red Flag, you need to create a squadron or three and join one. Here's how to do that:

1. To create a squadron, click the Form button in the lower-right corner of the War Room (if you never got your mouse running, use the arrow keys and ↵ instead). Up and down arrows will appear on the SQUAD monitor (the one above the Form button). The up arrow will be red at first, indicating that you can only scroll down; it'll turn green as soon as you use the down arrow.

TIP

You can form up to six squadrons at a time—enough to keep you busy for a while.

2. Click the green down arrow to scroll through the squadrons you can form: Fighting Tenth, Swamp Fox, Hooters, and so on. The insignias of the squadrons will appear in the SQUAD monitor.
3. Click on an insignia to form a squadron. Its name will appear on the World Map (see Figure 6.1).

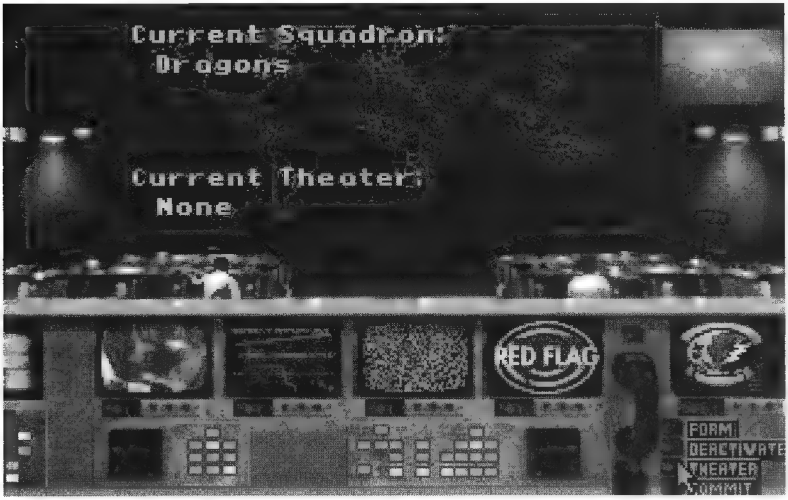

Current Squadron:
Dragons
Current Theater:
None

FIGURE 6.1 *Forming a squadron*

4. If you want, create more squadrons by repeating steps 1 to 3.
5. To join a squadron, click the SQUAD monitor until the squadron's name appears on the World Map.

Now that you've created a squadron and joined it, you're ready to enter Red Flag. Click the RED FLAG monitor to start Red Flag.

WARNING

Before you try out any of the other buttons in the southwest corner of the War Room, let me warn you that the Deactivate button is the one you use to delete a squadron. Falcon 3.0 will ask if you're sure about doing this. Once you've confirmed the deletion, the squadron, its pilots, and their statistics are gone—you can't get them back.

NAVIGATING THE AREAS OF RED FLAG

Red Flag has a number of screens that you'll soon become familiar with as you use them. The next sections explain which screen does what, what you might want to do when, and why.

RED FLAG CONTROL

As soon as you enter Red Flag from the War Room, you'll see the Red Flag Control screen (see Figure 6.2). This is where you load, save, and delete mission files.

Here's what the buttons in the Red Flag Control screen do:

Clear Mission	Clears all mission data from the map except one Allied flight of aircraft and one Enemy flight.
Load Mission	Loads the mission that you've highlighted on the video screen in the top-right corner of the Red Flag Control screen. You'll be prompted *Load this mission? Y/N*. Press **Y**.

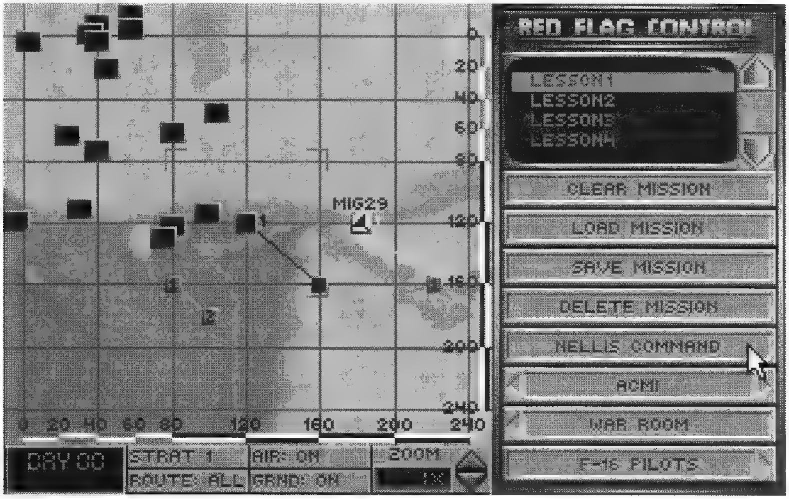


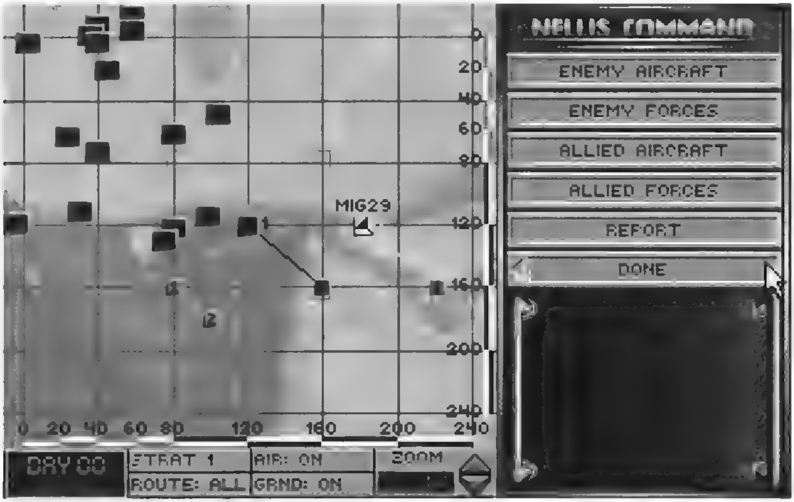
FIGURE 6.2 *The Red Flag Control screen is where you load, save, and delete mission files.*

Save Mission	Saves a mission you've created. You'll be prompted to enter a name (up to eight characters). Press ↵.
Delete Mission	Deletes the mission you've highlighted on the video screen in the top-right corner of the Red Flag Control screen. Falcon 3.0 will prompt you for confirmation before deleting.You can't delete the preset training missions, even after you've successfully flown them all. Sorry.
Nellis Command	Starts the mission editor for editing existing missions that you've loaded or for creating new missions.

ACMI	Starts ACMI (Air Combat Maneuvering Instrumentation) so that you can review a mission you've videotaped.
War Room	Returns you to the War Room.
F-16 Pilots	Takes you to the F-16 Pilots screen.

NELLIS COMMAND

The Nellis Command screen (see Figure 6.3) is where you set up your missions by allocating allied and enemy air and ground forces.



DAY 00
STRAT 1
ROUTE: ALL
AIR: ON
GRND: ON

FIGURE 6.3 *The Nellis Command screen*

These are the three types of screens that you use to coordinate your missions:

Aircraft screens Create the flights for the mission.

Waypoint screens Choose flight route, speed, altitude, and actions for each flight of aircraft.

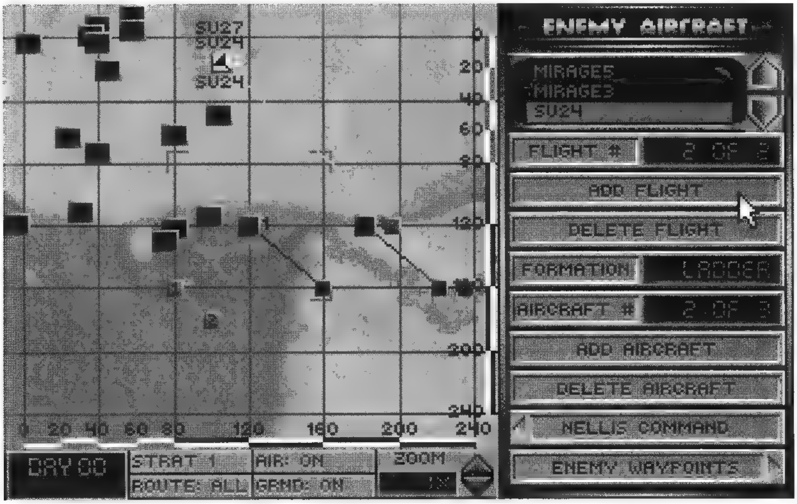
Setup Screens Decide what weapons the aircraft other than F-16s will carry.

Because the screens are essentially the same for allied and enemy forces, we'll look at the screens in pairs.

ALLIED/ENEMY AIRCRAFT

Use the Allied Aircraft and the Enemy Aircraft screen (see Figure 6.4) to choose:

- the types of aircraft to participate in the mission



FLIGHT # 2 OF 2

FORMATION LADDER

AIRCRAFT # 2 OF 3

STRAT 1

ROUTE: ALL

AIR: ON

GRND: ON

FIGURE 6.4 *The Enemy Aircraft screen*

- the flight routes of the aircraft
- the types of weapons the aircraft carry

NOTE

For any Falcon 3.0 mission, you can have up to eight enemy aircraft and eight allied aircraft flying in four or fewer flights for each side. (You'll always have one or more allied flights; your F-16 will always lead one allied flight.)

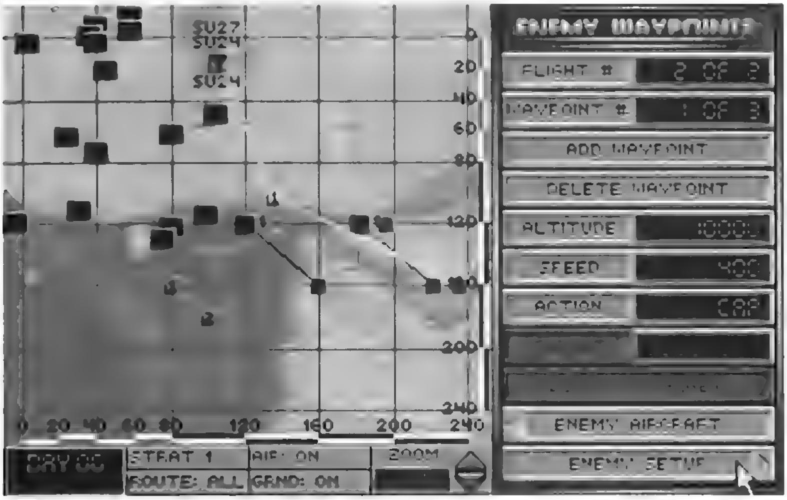
Here's how you can set up the enemy aircraft:

- To **add an aircraft**, highlight the aircraft to add in the Aircraft List on the monitor, and then click the Add Aircraft button.
- To **add a flight**, highlight the type of aircraft for the flight in the Aircraft list on the monitor, and then click the Add Flight button. Falcon 3.0 will add a standard flight route with a starting point and two waypoints to the map.
- To **choose a flight**, click the Flight # button.
- To **change the formation of a flight**, click the Formation button and choose the formation you want—V STACK, H STACK, C STACK, LADDER, WEDGE, VIC, or ECHELON.
- To **select an aircraft**, click the Aircraft # button to run through the aircraft on the flight by number.
- To **remove an aircraft from a flight**, select it by using the Aircraft # button, and then click the Delete Aircraft button.
- To **remove a flight** from the current mission, first choose the flight by clicking the Flight # button, and then click the Delete Flight button. You can't delete the first flight, so the button will be grayed if you only have one flight.

When you've finished arranging your flights, click either the Nellis Command button (to return to the Nellis Command screen to arrange waypoints for each flight) or click the Enemy Waypoints or Allied Waypoints button (to move to the appropriate Waypoints screen to set the flights' routes and actions).

ALLIED/ENEMY WAYPOINTS

On the Allied Waypoints or Enemy Waypoints screen (see Figure 6.5), you can set up to eight waypoints and assign an action to each. That action will be followed by all the aircraft on the flight.

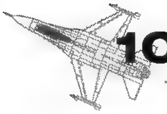


FLIGHT # 2 OF 2
WAYPOINT # 1 OF 3
ALTITUDE 10000
SPEED 400
ACTION CAP
STRAT 1
AIR: ON
ROUTE: ALL
GRND: ON

FIGURE 6.5 *The Enemy Waypoints screen*

Here's how to set waypoints and actions:

1. Choose the flight to work with by clicking the Flight # button.
2. Choose the waypoint to work with by clicking the Waypoint # button. The Altitude, Speed, and Action readouts will change to show what's set for that waypoint. To **add a waypoint** after the current waypoint, click the Add Waypoint button. To **remove a waypoint**, first select it by using the Waypoint # button, and then click the Delete Waypoint button.



3 Set the details for the waypoint. To set the **altitude** *above ground level* for the leg to the waypoint, click the Altitude button and enter a number between 0 and 70,000. To set the **speed** at which the flight approaches the waypoint, click the Speed button and enter a speed in knots between 160 and 1350. Keep the speed below the top speed of the slowest aircraft on the flight so that no aircraft falls behind the rest of the flight. To set the **action** the flight will perform on the leg of the mission to the waypoint, click the Action button and cycle through the possible actions (see the list coming right up).

TIP

You can check aircraft specifications by using the Report screen (details coming up in a moment).

Waypoint Actions

Here are the actions you can choose for each waypoint:

NOTHING makes the flight continue to the next waypoint unless attacked. The flight will not search for enemy forces.

CAP is Combat Air Patrol, in which the flight protects the flight route from enemy aircraft. The flight won't locate or destroy enemy ground forces it encounters. By setting up a string of CAP waypoints, you can arrange air cover for an area.

CAS is Close Air Support, in which the flight will search for and destroy enemy ground forces but not enemy planes. Set CAS waypoints seven or more miles away from the previous waypoint to give the flight time to select air-to-ground weapons and acquire targets.

S AND D stands for Search and Destroy, in which the flight will seek and destroy any enemy air and ground forces that it finds.

BOMB makes the flight bomb the designated target. Each flight can bomb only one target at any waypoint, so you'll need to set multiple flights to destroy multiple targets at any waypoint. To designate a target for the flight, click the Target button (which is activated once you've chosen BOMB) to display the *target frag list*, which lists the targets at the site in order of military importance, and then click the target for the flight. You can click the Zoom to Target button to have the map show a 3-D view of the target. The image will rotate; click the mouse to freeze it when it reaches the right angle.

INTERCEPT makes the flight attack all enemy aircraft it encounters. Since the flight will pursue the enemy for a distance, use INTERCEPT for defending a wide area rather than a localized area.

LOITER lets you set up a continuous patrol by having a flight repeat a string of CAP waypoints for as long as it has fuel to do so. For example, if you set CAP waypoints at 2, 3, and 4 and a LOITER waypoint at 5, the flight would repeat waypoints 2, 3, and 4 until low fuel drove them back to base. You can't use LOITER with waypoints other than CAP.

ESCORT causes the flight to protect a corridor around its flight route. It will engage only aircraft that threaten the escorted flight.

LAND makes the flight land, and is automatically set for the last waypoint of a mission (surprise!). Don't set LAND waypoints where there isn't an airfield....

TAKEOFF applies only to the F-16 you're flying and only to the first action for the mission. Your wingmen will join you in the air. Note that you can also start a mission in the air by selecting a different action for the first waypoint and setting an appropriate altitude and speed.

When you've chosen the aircraft for the mission, click either the Nellis Command button to return to the Nellis Command screen or the Enemy Setup or Allied Setup button to move to the appropriate Setup screen.

ALLIED/ENEMY SETUP

In the Setup screens (see Figure 6.6) you choose the weapons for the enemy or allied planes taking part in the mission.

NOTE

You don't use the Setup screens for arming the F-16s, just the other aircraft. You arm the F-16s in the F-16 Pilots and F-16 Armament screens, which we'll get to in a few minutes.

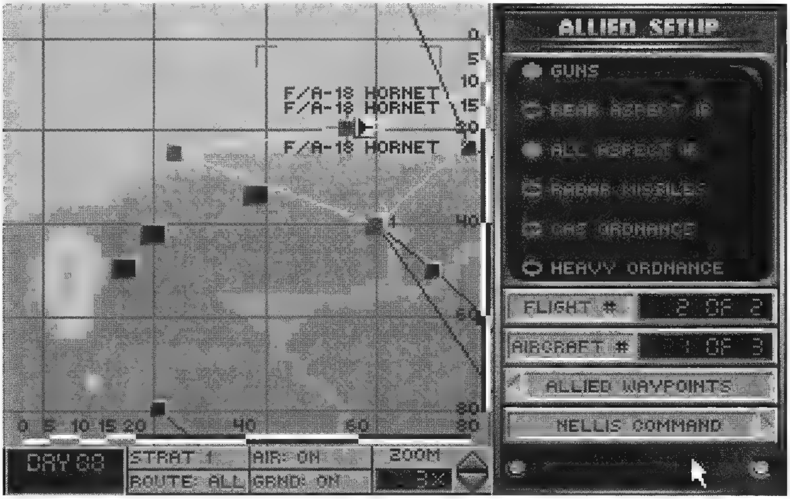


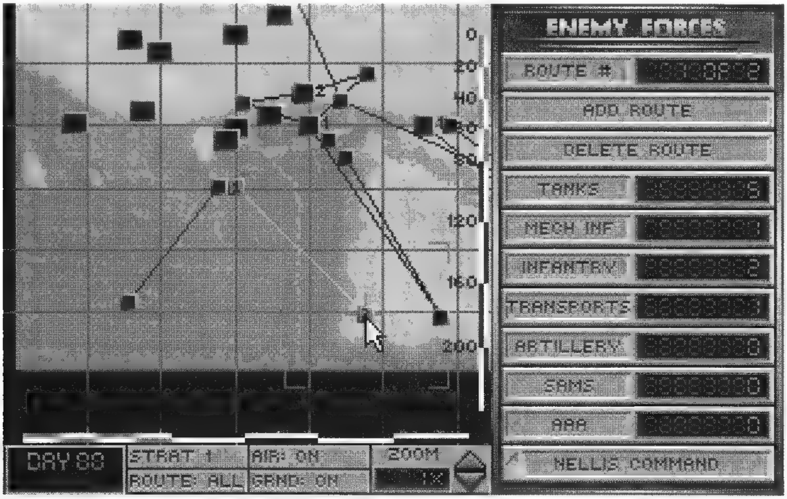
FIGURE 6.6 *The Allied Setup screen*

Each plane you assign to a mission already is carrying a default load; here you customize the weapons if you want to:

1. Choose the flight to which the aircraft belongs by clicking the Flight # button, and then choose the aircraft by clicking the Aircraft # button.
2. Use the Armament list on the video screen to customize the load. Weapons with a circle to their left can be loaded on the plane. (Weapons without a circle can't.) If the circle is filled in, the weapon is loaded; if it's hollow, the weapon is not loaded. Click the circles to load and unload weapons.

ALLIED/ENEMY FORCES

The Allied Forces and Enemy Forces screens (see Figure 6.7) are where you set ground forces for the mission—tanks, triple-A, SAMs, infantry, and so on.



DAY 88
STRAT 1
ROUTE: ALL
AIR: ON
GRND: ON

FIGURE 6.7 *The Enemy Forces screen*

You can use up to 60 ground units, divided any way between allied forces and enemy forces, and among up to four routes. Each route has a starting point and an ending point that you can drag anywhere on the map. Units travel straight along their routes (disregarding the terrain!) and engage any enemy forces you make them meet.

Here's how to set up ground forces:

1. Choose the route to change by clicking the Route # button. To add a route, click the Add Route button. To delete the selected route, click the Delete Route button.
2. Arrange the routes by dragging their start and end points on the map.
3. Set the number of units in a selected route by clicking the button for the type of unit—Tanks, Mechanical Infantry, Infantry, Transports, Artillery, SAMs, and AAA. The maximum is seven of any

type of unit in a route (again, the maximum number of units for both sides together is 60).

4. Click the Nellis Command button when you've finished setting up ground forces.

REPORT SCREEN

You can use the Report screen (reached by clicking the Report button) to check out the specifications of any aircraft or ground vehicle in Falcon 3.0. This is a great place to learn the strengths and weaknesses of both allied and enemy forces.

Click the button of the type of unit you want to see. The mission computer will appear, showing the specifications, a photograph, and a rotating 3-D model of the unit.

Click the View buttons to cycle through the list of aircraft or vehicles. Scroll up and down the screen to read the text when necessary.

Click the Exit button or press **Esc** to get back to the Report Screen menu.

F-16 PILOTS

The F-16 Pilots screen (see Figure 6.8) lets you choose which pilots should fly each mission. Since Red Flag's main purpose is training, you'll want to train your inexperienced pilots to prepare them for campaigns.

When you move to the F-16 Pilots screen, you'll see Falcon 3.0's default assignment of pilots to the aircraft you selected in the Allied Aircraft screen. You can change these pilots by clicking the name of the pilot you want to assign on the pilot roster in the upper-left corner of the screen, and then clicking the F-16 you want him to fly. (The original pilot of the aircraft will return to the roster; you can assign him to another F-16 if you want.)

Use the Flight # display and Flight button to switch between the flights of allied aircraft that you arranged for the mission.

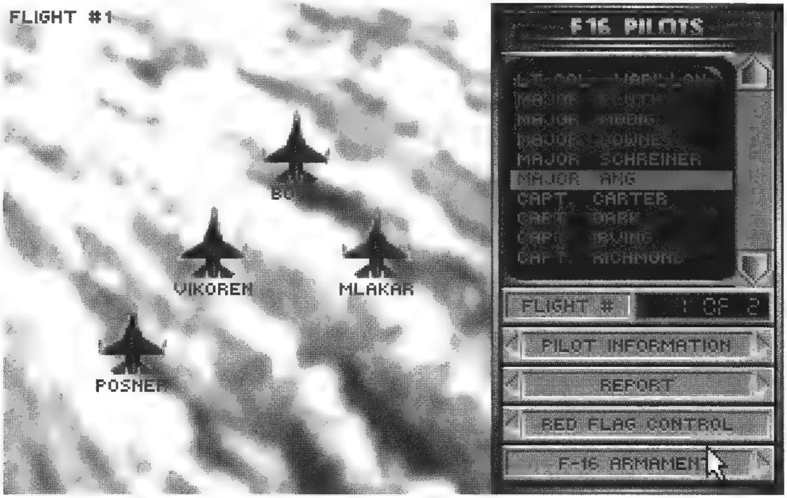


FIGURE 6.8 *The F-16 Pilots screen lets you assign pilots to fly the F-16s in the mission you've chosen.*

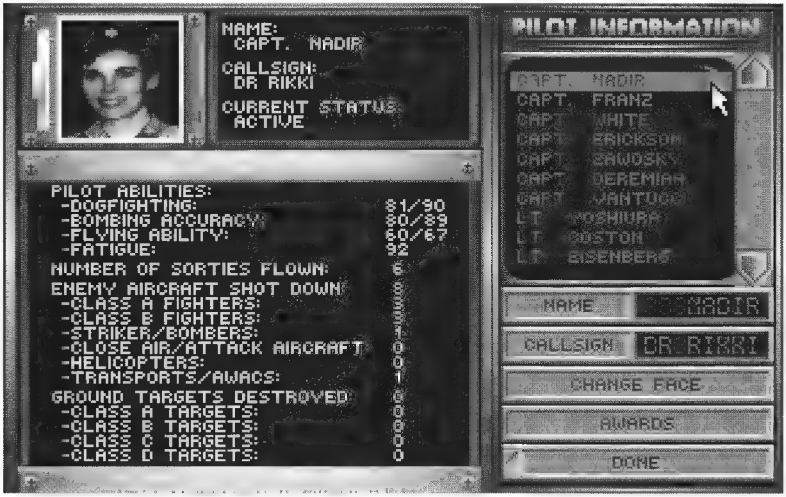
To view information on a pilot, click the Pilot Information button to move to the Pilot Information screen (discussed in the next section).

PILOT INFORMATION SCREEN

Turn to the Pilot Information screen (see Figure 6.9) when you need the lowdown on the pilots in your squadron. In Red Flag, you can use this information to see which pilots need training in which areas to bring them up to scratch; in Campaign, you can use it to decide which pilots are best suited to which missions.

Here's what the statistics on the Pilot Information screen mean (the Name and Callsign at the top of the screen you can work out for yourself):

Current Status *Active* means the pilot is available to fly; *MIA* means that the pilot is missing in action, having been shot down and captured; *Killed* means that the pilot was killed in action; and *Back in n* means that the pilot will return to active duty in the number of days shown.



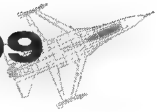
```
NAME:
 CAPT. NADIR
CALLSIGN:
 DR RIKKI
CURRENT STATUS
 ACTIVE

PILOT ABILITIES:
 -DOGFIGHTING:                  81/90
 -BOMBING ACCURACY:             80/89
 -FLYING ABILITY:               60/67
 -FATIGUE:                      92
NUMBER OF SORTIES FLOWN:         6
ENEMY AIRCRAFT SHOT DOWN:        8
 -CLASS A FIGHTERS:              3
 -CLASS B FIGHTERS:              3
 -STRIKER/BOMBERS:               1
 -CLOSE AIR/ATTACK AIRCRAFT:     0
 -HELICOPTERS:                   0
 -TRANSPORTS/AWACS:              1
GROUND TARGETS DESTROYED:        0
 -CLASS A TARGETS:               0
 -CLASS B TARGETS:               0
 -CLASS C TARGETS:               0
 -CLASS D TARGETS:               0
```

FIGURE 6.9 *The Pilot Information screen contains detailed stats on all the pilots in your current squadron.*

Pilot Abilities Shows the pilot's four ability scores, from 1 (low) to 100 (high). Note that the first figure represents the pilot's current state, while the second shows his known maximum.

Here are the areas in which your pilot's abilities will be scored:

- **Dogfighting** shows the level of Basic Fighter Maneuvers (BFM) and Air Combat Maneuvers (ACM) the pilot can use, including situational awareness.
- **Bombing Accuracy** measures skill in bombing moving and stationary targets, in using bombs effectively (the right bomb for a given target), and in bombing the enemy rather than allied forces.
- **Flying Ability** covers the skills that Dogfighting doesn't—flying below radar, avoiding SAMs, and close formation flying.



- **Fatigue** shows the pilot's resistance to physical and emotional stress; a high figure represents high resistance to stress. Each sortie a pilot flies lowers his Fatigue rating, which affects his current score for each other rating.

TIP

You can increase a pilot's Fatigue rating (and thus his current score for Dogfighting, Bombing Accuracy, and Flying Ability), by resting him—leaving him out of a possible mission—when his scores have dropped. Prevent your men from getting burned out by giving them a rest whenever possible.

Number of Sorties Flown Shows the number of missions the pilot has flown (all right, so you'd guessed that one. And the next).

Enemy Aircraft Shot Down Shows the pilot's confirmed kills. The six categories of aircraft range from Class A Fighters (those as good as or better than an F-16—for example, the MiG-29) through Class B Fighters (those not as good as the F-16, such as the Mirage III) to Transports/AWACS, the easiest targets in Falcon 3.0.

Ground Targets Destroyed This shows the number of ground targets a pilot has destroyed, broken down into four categories: Class A Targets (those that shoot back, such as SAMs), Class B Targets (tough targets, such as runways and bridges), Class C Targets (medium-sized buildings, tanks), and Class D Targets (soft targets, such as infantry or trucks).

Changing Your Pilots

So much for the information about the pilots. But what if you don't like a pilot's name or face? Simply change it:

- Click the Name button to give the pilot a new name (twelve letters max).
- Click the Callsign button to give the pilot a new callsign (fifteen letters max). Callsigns identify the pilots in combat, so make them both memorable and comprehensible.
- Click the Change Face button to run through the faces the pilot can have. (Don't worry—"there will be no pain.")

Click the Awards button to display the awards the pilot has received; click the same button (now marked Information) to get back to the information screen.

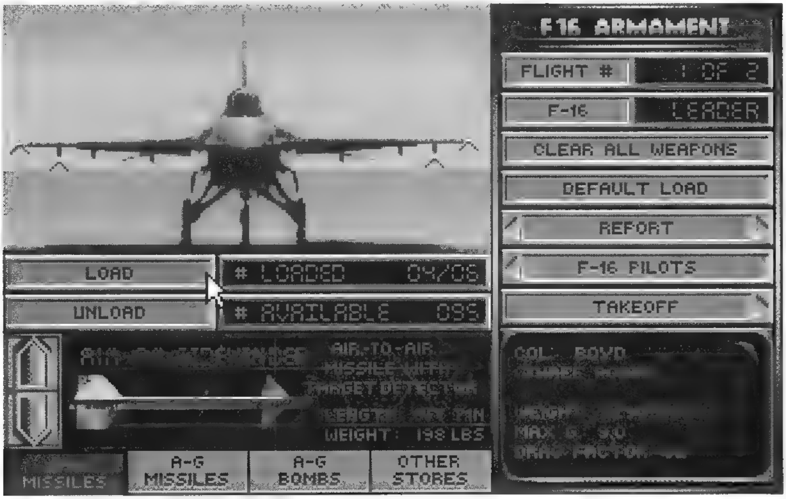
Click the Done button to leave the Pilot Information screen.

F-16 ARMAMENT

The F-16 Armament screen (see Figure 6.10) is where you load up the specific weapons for the F-16s in the mission.

First, select the flight in which the plane will fly by clicking the Flight button. Then click the F-16 button to choose which plane to load.

> **NOTE**
>
> **Each plane will already be loaded with a default set of weapons, so all you're doing here is a little customization. You don't have to load each plane bomb by bomb.**



FLIGHT # 1 OF 2

F-16 LEADER

LOADED 04/06

AVAILABLE 099

WEIGHT: 198 LBS

FIGURE 6.10 *The F-16 Armament screen. Loading the right weapons is crucial to the success of your missions.*

To load weapons or stores:

1. Use the buttons at the bottom of the screen to choose the category of weapons: A–A Missiles, A–G Missiles, A–G Bombs, or Other Stores.
2. Scroll through the available weapons to select the one to load, and then click the Load button. As you can see on the left side of the screen, the F-16 has nine mounts on which you can load weapons and stores: four pylons on each wing, and the centerline mount. You can load heavier weapons and stores only on the inner pylons. You need to load and drop heavier weapons in tandem so as not to unbalance the aircraft. The internal M61A1 cannon is always fully loaded with its 515 rounds.

To remove weapons or stores from your aircraft, select the item to remove by using the category buttons and the scroll arrows, and then click the Unload button.

- The Loaded readout shows you how many units of the current weapon are loaded and how many could be loaded.
- The Available readout shows you how many units of the current weapon are left.

We looked at Falcon 3.0's various weapons in Chapter 4. Here's a quick look at the other stores you can load:

- **External fuel tanks** increase your range but lower your speed and spoil your aerodynamics. You can load either a 300-gallon tank on the centerline mount or two 370-gallon tanks on the pylons.
- The **ALQ-131 ECM pod** gives you the means to prevent ground-based SAMs locking on to you by radar; it also works to some extent against the radar on enemy aircraft. The downsides of the ECM pod are *1)* it slows you down, *2)* it loads on the centerline mount, which means you can't load a 300-gallon external fuel tank at the same time, and *3)* it tells every enemy within radar distance exactly where you are—the electronic equivalent of a huge EAT AT JOE'S sign on your F-16.

For quick unloading of everything on the selected F-16 *except a pair of AIM-9Ps on the wingtips,* click the Clear All Weapons button.

If you screw up your loading and need to restore the default load on the current F-16, click the Default Load button.

Use the Aircraft Information in the lower-right corner of the F-16 Armament screen to make sure you don't overload your F-16s—you can severely handicap a mission by increasing the plane's takeoff weight, thus increasing drag and reducing its maneuverability. The statistics shown here are the takeoff weight, the maximum Gs the plane can pull with its current load, and the drag factor (the lower the better).

When you've finished loading the F-16s, click the Takeoff button to start the mission.

FLYING

YOUR F-16

SEVEN

SEVEN

Now that you've got the hang of blasting your foes from the skies in Instant Action, and you know how to set up missions in Red Flag, let's take a moment to learn some basic flying skills that will stand you in good stead for every flight you take. These are skills that you've so far been able to do without in Instant Action, thanks to its arcade-game style, but without which you can't progress in Falcon 3.0's more challenging modules.

In the first half of this chapter, we'll go through three basic skills: takeoff, landing, and navigating. In the second half, we'll blaze through the eight training missions and two reviews that come with Falcon 3.0 and that give you the chance to practice these skills.

TAKEOFF, LANDING, AND NAVIGATING

Both takeoff and landing are crucial to the success of any mission, and while both are basic maneuvers, neither is simple. Each presents you with plenty of chances to screw up and crack up. But once you get the hang of takeoff and landing, you shouldn't have any more trouble with them. Navigation, though, is something you'll probably need to work at for quite a while before it becomes second nature.

That said, let's get straight into takeoff.

TAKEOFF

Takeoff seems pretty straightforward, right? Point the plane down the runway, wind the engine up, and pull her off the ground. Right—up to a point. As you'll learn in this section, there are half-a-dozen things to think about during takeoff. Get them wrong, and you can make hamburger of yourself either when you take off or when you land.

WARNING

Don't hang about on the runway after your speed reaches 150 knots, or you might damage your tires. Even if you don't blow them out and decorate the runway with your plane and yourself (see Figure 7.2), you might have trouble landing on damaged tires.

Set up your mission as discussed in Chapter 6. When you've got everything to your satisfaction, click the Takeoff button in the F-16 Armament screen. After the animations (if you've got them turned on), you'll find yourself in the cockpit looking down the runway (see Figure 7.1).

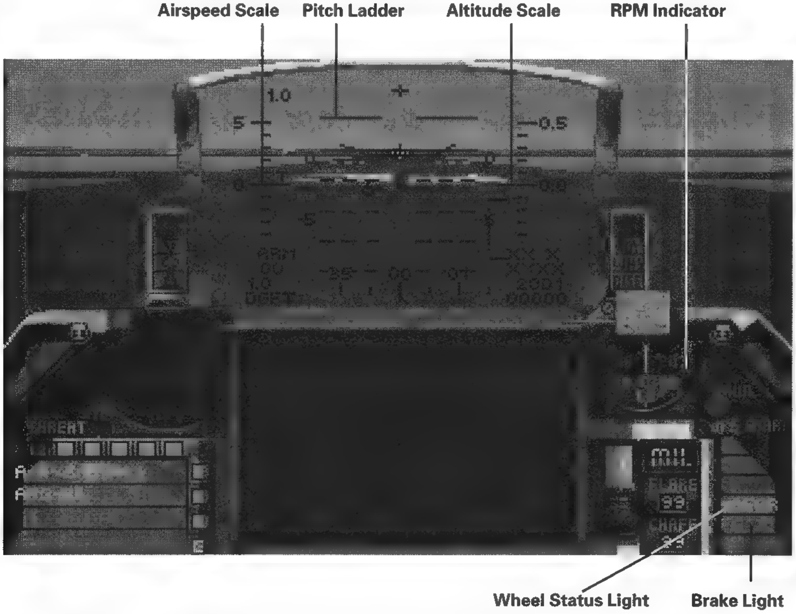


FIGURE 7.1 *In the cockpit, on the runway, ready for takeoff*

Now take off by following these steps:

1. Engage the engine: Press + (or use the button on your joystick) to wind up the RPM Indicator to 60%. Your F-16 will start to roll down the runway.
2. Engage the afterburners by pressing /. You'll suddenly be rolling a bunch faster. Keep one eye on the runway and the other on your Airspeed Scale.
3. When your speed gets above 150 knots, pull back gently on the stick so that the Pitch Ladder shows about 10%. You'll be off the ground in a moment, and climbing (see Figure 7.3). See the Warning on the previous page.

WARNING

Raise your landing gear ASAP, or you'll wreck it—which you'll certainly regret when it's time to land. Flying at over 300 knots with the gear down will permanently damage your aircraft, not to mention make it handle like a Ferrari with four flats. Bitchin' Betty will start screaming "Caution! Caution!" once you pass 300 knots with your gear down, but by then some damage will already have been done. If you think you've damaged your landing gear, switch to Right View (by pressing 6 or 9 on the numeric keypad) to check the Caution Light Panel. If the NWS Caution Light is on, you've damaged your Nose Wheel Steering System and landing will be a problem. Land as softly as possible.

FIGURE 7.2 *Another brave attempt to break the land-speed barrier falls prey to flaming rubber. Get off the ground before you reach 220 knots, or this might happen to you.*

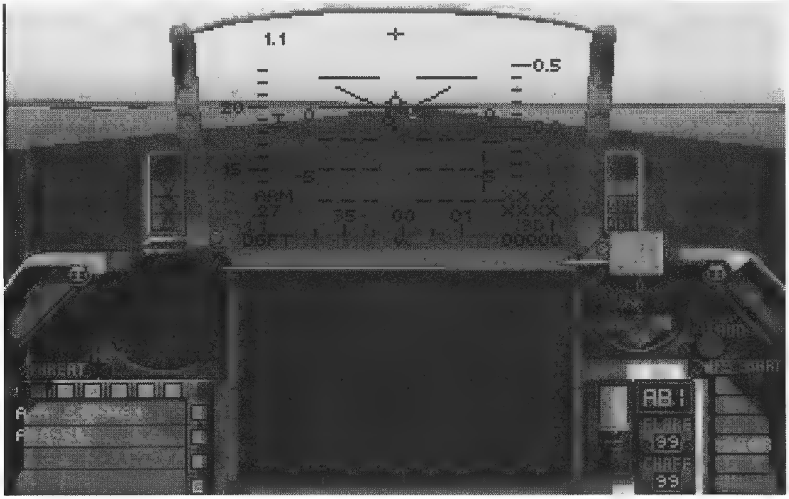


FIGURE 7.3 *The moment of truth: At 150 knots, pull the stick back gently till the Pitch Ladder shows a 10% rate of climb. As soon as you're off the ground, press G to pull up your landing gear.*

4. Raise your landing gear as soon as you're sure you're off the ground: Press **G**. You'll hear the gear being raised, and the Wheel Status Light will be extinguished. See the Warning on the opposite page.
5. Pull back on the stick to increase your angle of climb to 20–30°, and keep it there till you reach the altitude you need for the mission.
6. Push the stick forward to level off, bringing the Pitch Ladder to 0°.
7. Press \ again to switch off the afterburner. If necessary, press – to bring your RPM down from 100% to about 60%.

Now that you're in the air, proceed with your mission as planned.

NAVIGATING

Given Falcon 3.0's many theaters of operations—six for Falcon 3.0 and Operation: Fighting Tiger, not to mention the extra theaters in MiG-29 and Hornet—you may take a while to find your feet. Red Flag is the place to learn how to navigate using the instruments and what you can discern of the terrain before you head into combat for real.

Navigation in Falcon 3.0 is straightforward in theory but not in practice. At first, you may find yourself too busy judging your vertical relationship with the ground to keep track of how you're doing horizontally.

Here are the five basics of navigation:

- Know where you're supposed to be going. Study your mission beforehand, and note salient features of the terrain.
- Use the heading scale to keep track of which way you're pointing.
- Use the waypoint caret to determine where you're *supposed* to be pointing.
- Use the Distance to Waypoint readout on the HUD to find out how far you are from each waypoint.
- Keep track of your surroundings as far as you can so that you can navigate visually if your instruments get shot up.

That said, Falcon 3.0 does offer you one further navigation aid: the cockpit map. Read the next section and be the judge of how much use this is.

Using the Cockpit Map

If you get into desperate straits, you can use Falcon 3.0's *cockpit map* to check where you are in the theater you're currently operating in. (Until you're in a bad way, you probably won't find it much use. Given how hard it is to recognize features of the landscape in Falcon 3.0 even with High Detail turned on, identifying your position from a tiny map isn't easy.)

To bring up the cockpit map, press **C** and it'll appear on your REO (see Figure 7.4).

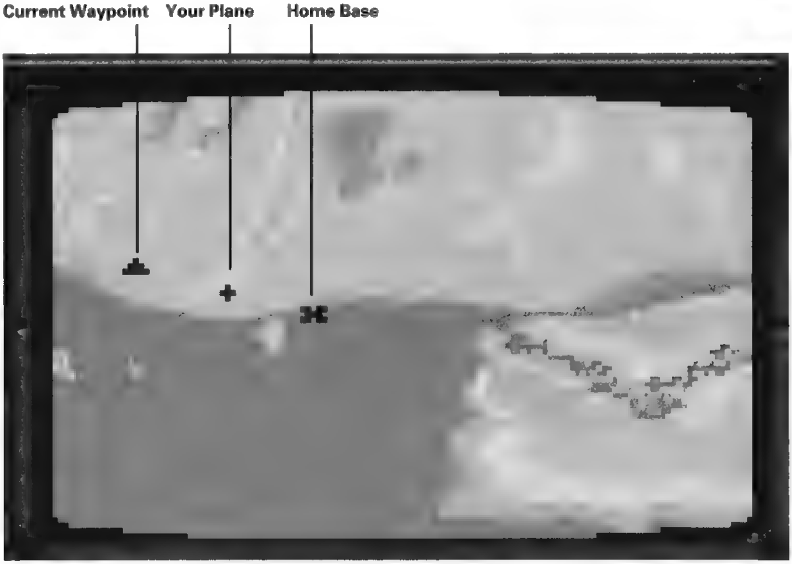


FIGURE 7.4 *The cockpit map shows you your current position, your current waypoint, and your home base. The map isn't very detailed, and you may well not find it useful beyond getting a very general idea of where you are in your current theater.*

The cockpit map shows you three things:

- The red cross (how appropriate!) shows the position of your plane. You can easily pick this out because it'll be moving.
- The red X shows you your home base. The map's been known to get this wrong, so don't rely on this unless you can't use your waypoints for some reason.
- The green triangle indicates your current waypoint. This is updated when you change waypoints.

In general, you'll do better to use your heading scale, your waypoints, and your eyes to find your way than to rely on the cockpit map.

LANDING

If you thought takeoff was tricky, well, you ain't seen nothin' yet. Landing's one hell of a lot harder (though there are a couple of quirks in Falcon 3.0 that make it easier—we'll get to them in a few pages). Even the best pilots take a while to get the hang of landing, so don't worry if you decorate the landscape a little on your first few tries. Remember meeting the ground a few times while learning to ride your first bike? Be prepared for the same kind of thing to happen here. After all, that's what flight simulators are for—taking a few falls without enriching the medicos.

Read through this section, and then try landing a few times. Once you get the technique down, it'll be yours for life.

Here's how to use the Instrument Landing System (ILS) to land at runways that broadcast ILS signals:

1. Switch on the ILS by pressing \. You'll see the Localizer Deviation Bar and Glide Slope Deviation Bar (see Figure 7.5). The **Localizer Deviation (LD) Bar** tells you how you're aligned relative to the center of the runway. The **Glide Slope Deviation (GSD) Bar** tells you your vertical angle to the runway.

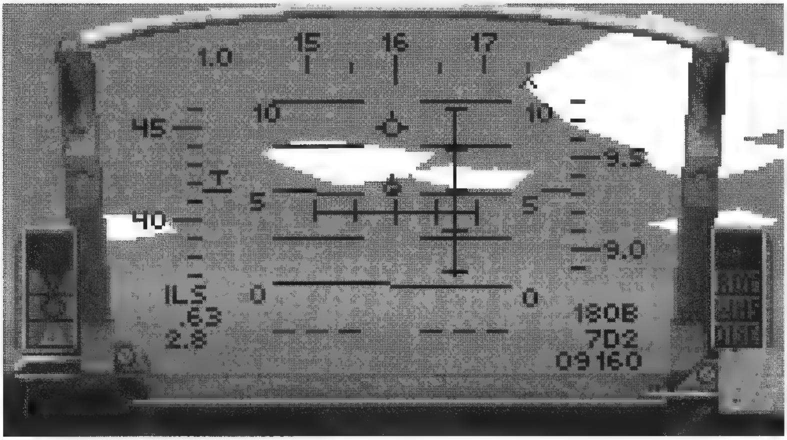
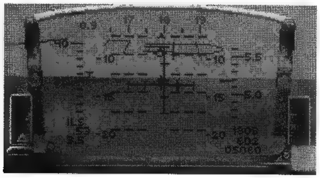


FIGURE 7.5 *The ILS HUD mode. Here the Localizer Deviation Bar and Glide Slope Deviation Bar are telling me that I'm high and to the left of where I want to be.*

2 Line your plane up with the runway by aligning the LD Bar and GSD Bar into a perfect cross:



3 Find out how far you are from the runway by checking the Waypoint Indicator in the lower-right corner of the HUD—the first figure is the number of miles to the airfield, your next waypoint.

4 Use the Angle of Attack Indexer to establish your angle of approach to the runway: The top caret means your angle of attack is too high—increase your airspeed to correct it. The center circle means that you're at a suitable angle of attack—hold your configuration. The bottom caret means that your angle of attack is too low—slow down a little by pulling the nose of your plane up, or by using your speed brakes or flaps (we'll discuss how to use these in a moment).

5 Aim to reach an altitude of 1000 feet when you're one mile from the runway.

6 Lower your speed to around 250 knots, and then drop your landing gear by pressing **G**. The top and bottom lights of your AR/NWS Status Indicator will light up, and your Wheel Status Light will go on. If need be, add more power to compensate for the extra drag once you've lowered your landing gear.

7 When you can see the runway, aim the Flight Path Marker right at the beginning of the runway, as shown in Figure 7.6.

8. Lower your airspeed to between 160 and 200 knots, and then try to keep it steady. If it falls too low, you might stall; at such a low altitude, you wouldn't be able to recover, though you would probably be able to eject safely.
9. If necessary, use the left and right rudder-control keys (the bracket keys—[and]) to make last-minute adjustments in direction to stay lined up with the runway.
10. Check that your angle of attack is 8% or more and that your speed is still between 160 and 200 knots, and then ease the plane down onto the ground (see Figure 7.7).

WARNING

For all the help it gives you, the ILS doesn't tell you one critical thing—whether you're facing the right way or not. You can align the LD Bar and GSD Bar even if you're facing 180° in the wrong direction. Make sure you know the direction of the runway you're trying to land on, and make doubly sure that your plane is pointed at it by using the Heading Scale. Bear in mind that most runways are aligned north, south, east, or west, so you'll be looking for a bearing of 0°, 180°, 90°, or 270° on your approach. You'll find it briefly and spectacularly embarrassing to try to land across a runway instead of along it.

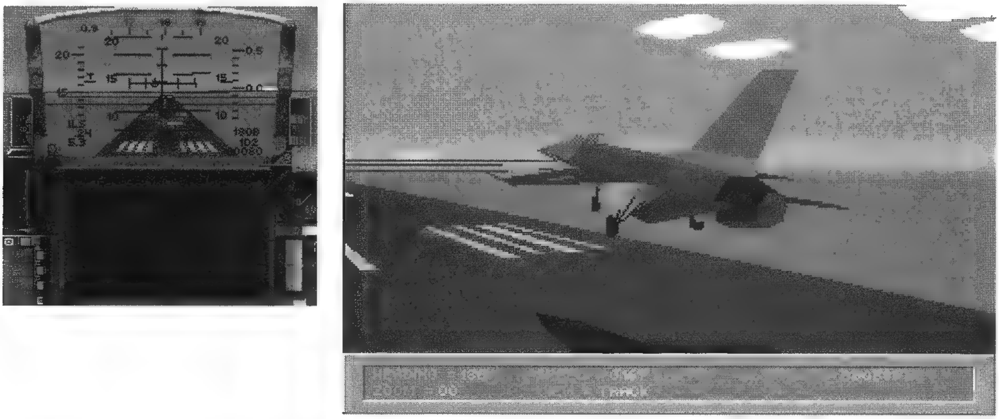


FIGURE 7.6 *Lined up and ready to land*

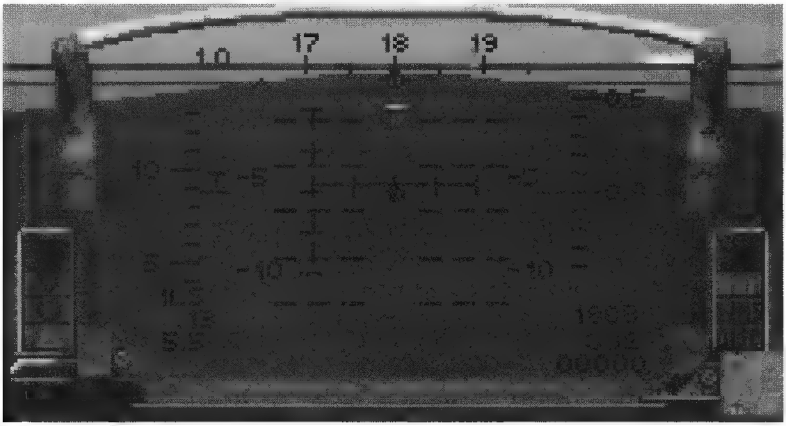


FIGURE 7.7 *Safely down on the ground*

11 Once your wheels are safely on the ground, press **B** to engage the speed brake and **F** to drop your flaps.

12 Press – to throttle back to 0% on the RPM Indicator.

13 Press **W** to use your wheel brakes to bring your speed down to below 50 knots, and then press **W** again to release the wheel brakes.

14 Taxi to where you need to be, and then press **W** again to bring your plane to a standstill.

NOTE

Falcon 3.0 mimics *ground effect,* the extra lift your aircraft gets close to the ground from the air being compressed between the aircraft and the ground. If you pull the nose of your plane up suddenly at the last moment, ground effect may cause you to bounce back up into the air. Try to maneuver smoothly and gently on your final approach.

Aborting a Landing

If you suddenly realize that you're not going to make it—for example, if you screw up your angle of attack or discover that you're landing across the runway rather than along it—simply abort the landing.

Slap the throttle wide open (press +) to increase your airspeed and pull the nose back to level off. Then fly around the airstrip and set yourself up for another pass.

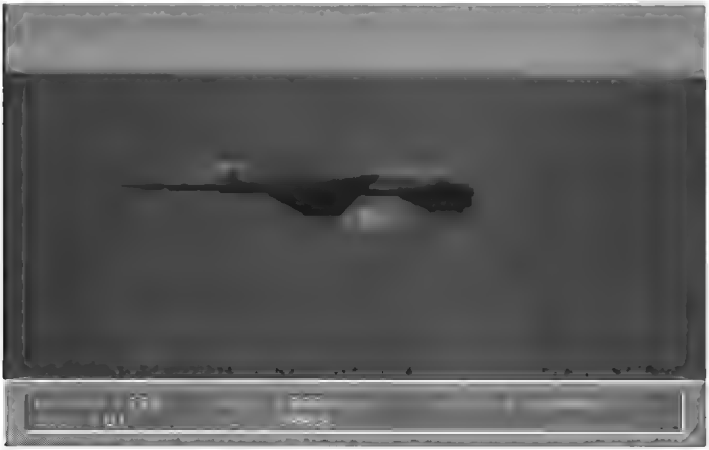
Using the Visual Approach Slope Indicator (VASI)

Falcon 3.0E, Operation: Fighting Tiger, MiG-29, and Hornet include the Visual Approach Slope Indicator or VASI, a new landing aid that shows you whether you're above or below the glide slope.

VASI uses two pairs of lights at the near end of the runway. If both lights show red, you're above the glide slope and need to push your nose down. If both lights are white, you're below the glide slope and need to pull the nose up. If the front lights are white and the rear lights are red, you're on the glide slope.

LANDING IN BIZARRE PLACES

Despite the realism of much of the landing process—the ILS, the instruments, the flaps, the brakes, etc.—Falcon 3.0 isn't consistent about making you land properly. You **do** need to keep your airspeed under 220 knots, your angle of attack between 10° and 16°, and your glide slope between 3° and 6°. You can't land without your landing gear down. But if you satisfy those requirements, you can land on almost any surface—not just on a runway or a road, but on a mountainside or in the sea. Try it for yourself. The F-16 in the illustration has landed safely in the sea. It can even take off again....



This extra latitude may seem ridiculous, but you'll probably find yourself thankful for it when you get into trouble in Campaign. In Hornet, if you can't find the carrier or run out of fuel on your way back to it, you may be glad to know that your F/A-18 can walk on water.

Red Flag has no VASI systems, but Campaign does. If you see the red and white lights, use them to check your relationship to the glide slope.

AUTOPILOT

Falcon 3.0's computerized autopilot greatly exceeds the brief of the autopilot in a real F-16. You can use the autopilot as a training aid, to take over control of the plane for you when you're in trouble, or even to get you into the best possible attacking position in a dogfight.

You can engage the autopilot at any time by pressing **A**. This works as a toggle—press **A** again to disengage the autopilot.

Accelerated Mode

Once you've engaged the Falcon 3.0 autopilot, you can switch to Accelerated Mode. Accelerated Mode makes everything happen four times faster, so life gets pretty exciting. When you're in Accelerated Mode, the words ACCELERATED MODE will flash in the middle of the screen.

- To engage Accelerated Mode for a moment, press Tab and hold it down.
- To switch to Accelerated Mode, press **Shift+Tab**. (Press **Shift+Tab** again to switch Accelerated Mode off.)

WARNING

While you *can* use Accelerated Mode without the autopilot engaged, it's usually very unwise to do so unless you've just drunk a couple gallons of espresso and are feeling wired. If you try Accelerated Mode in combat, or when maneuvering within easy commuting distance of the ground, you'll see what I mean. Things are liable to reach out and whack you before you've even seen them properly.

One exception is when you're in a situation over which you have no control, and you want to speed your progress through it. For example, if you've ejected successfully, free-fallen to 5000 feet, and are now drifting down slowly with your 'chute open, you can switch to Accelerated Mode to hurry things up, so that you can report back and start another mission pronto.

USING FALCON 3'S FLYING TRAINING LESSONS

Falcon 3.0 comes with eight training missions and two reviews to get you versed in the basics of flying and combat. Once you've mastered these, you can design your own training missions in order to develop further skill in areas of your choosing.

Here's what the lessons cover:

Lesson 1	Takeoff and flight
Lesson 2	Using the Head-Up Display
Lesson 3	Using the various views
Lesson 4	Landing
Lesson 5	Selecting weapons and using the SAM radar
Lesson 6	Firing air-to-air weapons
Lesson 7	Firing air-to-ground weapons
Lesson 8	Using Padlock view

The two reviews cover:

Review 1	Takeoff, flight, and landing
Review 2	An air-to-air and air-to-ground engagement

In the following sections, we'll discuss what each lesson is designed to teach you, and the actions you should be performing in each.

LOADING THE LESSONS

In case you skipped the last chapter, here's a quick review of how to load a lesson:

1. Click the lesson you want on the monitor in the upper-right corner of the screen.
2. Click the Load Mission button; answer **Y** to the *Are you sure? Y/N* message.
3. In the F-16 Armament screen, click the F-16 Pilots button to pass straight through the screen. (Armaments are already arranged for all the lessons.)
4. Click the Takeoff button.

LESSON 1

Lesson 1's main thrust is the takeoff. Follow the instructions earlier in this chapter to take off. Once you're in the air, you're free to fly around and practice maneuvering. This may seem pretty tame compared to Instant Action, but this is a good opportunity to practice switching between the various views and weapons. Try stalling and recovering a few times if you're feeling ambitious.

When you've gleaned as much practice as possible from this enemy-free time in the air, either try navigating back to the base by yourself or press **A** to have the autopilot do it for you.

LESSON 2

Lesson 2 is designed to bring you up to scratch with the HUD and the instruments, and to teach you what Redout and Blackout feel like. If you feel you've fooled around long enough in Instant Action to know how to use the HUD and instruments, and how many Gs you can safely pull before you go off to fly a cloud, skip ahead to Lesson 3.

Otherwise, run quickly through Lesson 2. If you're feeling especially lazy, you can simply press **A** to let the autopilot perform the takeoff. But you'd do better to use the takeoff for practice.

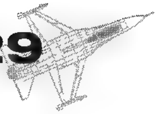
Take the plane up to 14,000 feet or so, and then level out. Pick up speed: Kick in the afterburners by pressing / and then increase the staging by pressing > twice so that the AB/Mil indicator shows *AB3*. Then practice maneuvering and pulling Gs to your heart's content with no enemy to harass you. This is a good chance to learn how much abuse an F-16 will take and what it'll balk at. You might even want to try a power dive and see how fast it'll go....

LESSON 3

Lesson 3 gives you a chance to use Falcon 3.0's various views (which we looked at in Chapter 4). This lesson is pretty much a free ride—it's designed for you to use the autopilot for takeoff and landing, and in between to try using the views in flight.

You've got a wingman on this flight, so try pressing **7** to see what he's seeing. Remember that you can use the zoom keys (**F1** and **F2**) and the rotate keys (**F3** and **F4**; and **Shift+F3** and **Shift+F4**) to look around your wingman.

This is a great opportunity to watch your F-16 landing from Track View, so press **9** before you engage the autopilot (**A**) to take you back to base.



NOTE

In this lesson, you're supposed to make a circuit of the airfield before landing—fly once over the runway at four or five hundred feet, fly a couple of miles past it, make a 180° turn, fly back parallel to the runway, and *then* turn in for a final approach and land. If this is too much to start with, simply land on the first approach the first few times you run through this lesson. Graduate to the circuit when you feel confident about getting the plane down safely. Ultimately, you'll find making the circuit before landing useful when approaching unfamiliar airfields, or if you're forced to approach from an unsuitable angle. But you should also practice landing on the first approach for when you need to if you've been hit, or if you've run out of fuel.

LESSON 4

OK, now it gets serious. Lesson 4 is the place to practice landing until you get it right.

To give you a little less to worry about, in this lesson you start out in the air, at 8000 feet and about eight miles north of the runway, so you can fly pretty much straight in.

Straight off, switch to the ILS HUD mode by pressing \. Unless you've already hauled your F-16 off course, your LD Bar and GSD Bar should be perfectly aligned, because you start off pointing in the right direction. Try to hold your plane steady, reduce your speed to about 400 knots, and aim to descend at 1000 feet a minute—an angle of around −7°. Now follow the instructions for landing outlined earlier in this chapter.

REVIEW 1

You'll like Review 1, because it gives you the chance to put what you've learned in the first four lessons into practice. Admittedly, you don't yet get to blow anything up—at least, you're not *supposed* to—but you get to fly the whole mission, so you're making quick progress. Solo in four lessons—not bad!

Here's how it goes:

1. Take off as usual.
2. Take your bird up to 15,000 feet, heading north (0°), and then level off and turn off the afterburners.
3. Bank left to 270°, and then straighten out and fly level for about a minute.

4. Bank left to 180°, and then straighten out and fly level past the airfield. Take a look at it to your left (use Left View) to make sure you're in the right place. (If not, navigate to the right position.) Fly straight for a minute or so.
5. Bank left to 90°, and then straighten out.
6. Use left view to see where the runway is, and then bank left to 0° to align your plane with it.
7. Switch on the ILS and make your first approach. As in Lesson 4, you're supposed to make a pass over the runway, and then circle 'round and land.

Don't worry if you don't get this review right the first time. Even though there are no enemy aircraft in the sky, you'll find you have plenty of things to watch. Concentrate on maintaining your height and heading to simplify the navigation—there's a lot of sky out there to get lost in!

LESSON 5

Lesson 5 gives you a chance to practice what we discussed in Chapter 4—selecting and using weapons. You'll be set up with a sitting duck of a MiG-27 for a target so that you can concentrate on controlling the weapons rather than maneuvering like a maniac.

At the beginning of this lesson, you'll find yourself in the air with the MiG-27 about 15 miles ahead of you. Check the radar to locate him. You're in SAM mode here; remember that in SAM mode your plane is at the bottom of the REO pointing upward.

TIP

Once you've got the hang of knocking down the MiG-27 straight in front of you, try the variants on Lesson 5: In Lesson 5L, the MiG-27 is on your left, heading north; in Lesson 5R, he's on your right, heading north; and in Lesson 5B, he's on your six, still heading north. Work with these three variants to hone your skill in engaging an enemy from various directions.

Now get ready for a quick victory:

1. Press ↵ to select your air-to-air weapons, then use ↵ to select the AIM-9M Sidewinders from the Stores Control Panel.

2. Get a visual sighting of the MiG-27 by using the Target Designator box.
3. If you have time, check your IFF by pressing **N** to make sure that he's an enemy. (This may be practice, but you should learn this habit now before you get the chance to pull a wilson and off any of your buddies.) If he's a good guy, the IFF will squawk at you.
4. Keep track of the enemy's bearing, heading, distance, and relative altitude by using the REO. Make any necessary adjustments to keep the enemy in your sights.
5. When you get a missile lock—when the Aiming Reticle starts to flash—fire the Sidewinder at the enemy.

Once you've knocked down the MiG-27, press **A** to plug in the autopilot to take you back to the mess for a celebration.

LESSON 6

Lesson 6 gets you further into the uses of air-to-air weapons: In it, you're set up with blind dates with three Mirage IIIs, one at a time, and then a MiG-23. You get to take them out by using your two types of Sidewinder and the AIM-120 AMRAAM. If need be, look back quickly at Chapter 4, *Using Views and Weapons,* before getting into this.

Once you get into the air, you'll find the first Mirage III at 12 o'clock heading away from you.

Select your AIM-9P Sidewinders and lock him up. Remember that the Sidewinder's growl will shift to a whine when you get a lock, and the Aiming Reticle will flash. Now fire and make sure you hit him.

The second bandit will now be to your north. Bank to 0° and fly north till you find him. Switch to the AIM-9P Sidewinder for practice and use that on him.

Next, you get a chance to use the AIM-120 AMRAAM at beyond visual range (BVR) on the third Mirage III. Switch to the AIM-120 and watch your HUD for the Target Designator Box to appear. Because of the 30-mile range of the AIM-120, you'll lock the Mirage up before you can see him.

When the Aiming Reticle flashes, loose the missile at him. By the time it hits, you should be able to see him.

Finally, you get a chance to use the M61A1 cannon on the MiG-23 you'll find coming at you. Get his wingtips within the sides of the aiming funnel and blow him away. If you miss on the first pass, keep after him until you get him.

That's enough for one day's work, so when you've polished off the MiG-23, press Esc to activate the menu bar, chose File ➤ End Mission, and answer **Y** to confirm it.

LESSON 7

Lesson 7 comes in two parts, 7A and 7B, and deals with selecting and using air-to-ground weapons. In Lesson 7A you're supposed to use the air-to-ground missiles, and in Lesson 7B the bombs, though there's nothing to stop you from using both missiles and bombs in each lesson if you want—you start out in a different place in each lesson is all.

If you've been concentrating on aerial combat in Instant Action, you'll want to pay special attention to this lesson. As you'll remember from Chapter 5, you can greatly increase your score in Instant Action by destroying runtime map objects on the ground—and of course ground-attack skills are important in Red Flag and vital in Campaign.

This lesson starts out above Nellis' gunnery range at an altitude of 3000 feet or so. Select your AGM-65B Mavericks by pressing Backspace, and then start looking for the tank park below you—it'll show up as brown specks on the ground. Once you've located it, aim the crosshair at a tank and you'll see its image appear in the REO. Fire the missile, and then press **T** to switch to another target.

Once you've taken out a few tanks with the Mavericks, switch to the AGM-88A HARMs or the AGM-45A Shrike and try them against other targets. Remember that the HARM's expense and its 30-mile range make it a more valuable weapon than the Shrike (which has a 12-mile range), so don't waste your HARMs.

When you're confident of your ability with the air-to-ground missiles, end Lesson 7A and fire up Lesson 7B. You'll find yourself at 5000 feet; fly north to find some targets, and then try attacking them:

- Use the Mk82 iron bombs on any tanks you find.
- Try the LAU 5003A rockets against jeeps or light armor.
- Use the M61A1 cannon against soft targets like trucks or infantry.

LESSON 8

Lesson 8 introduces you to Padlock view, which we looked at in Chapter 4. Flip back there for a quick review if necessary.

Once you get in the air, refresh your memory of Padlock view by pressing * on the numeric keypad and flying for a while in Padlock view. You won't meet any bad guys for the moment, so work on getting the hang of how the windows move when you move the stick.

When you're ready, switch on the autopilot. You'll find yourself flying north and tracking a MiG-23. Make sure you've got a Sidewinder and then go into action:

1. Get behind the MiG by following the Locator Line to pull the Targeting Rectangle toward your miniature HUD in the Target Locator window, so that your HUD appears in the Main window.
2. Bring the MiG inside your reticle. When the red box turns green, you've got a lock.
3. Fire the Maverick at the MiG. Keep aiming at him until you see it hit.

The second engagement in Lesson 8 is a little hairy—you'll find yourself with a MiG-23 and a MiG-27 coming at you from either side. Don't worry if you find this part of the lesson a little, uh, *challenging* the first couple of times through. Keep practicing until you get the hang of it.

To start the second engagement, switch to Front view, and then cut in the autopilot again and let him take you further north. When your Threat Warning Indicator tells you that there are bad guys around, switch off the autopilot and switch back to Padlock view. Now you're on your own: You need to decide which bandit to engage first, and then watch your six for the other.

Once you can make your way through Lesson 8, you're ready for the final countdown, Review 2, which brings together everything you've learned so far.

REVIEW 2

Review 2 is the real thing—a full mission for you to complete.

Here's how it goes:

1. Take off as usual, and then climb to 10,000 feet.
2. Check the waypoint for the direction.
3. Switch to your AIM-9M Sidewinders in case you meet any hostile aircraft along the way.
4. Keep track of your waypoints—the target is at waypoint two.
5. When you're ten miles from the target, switch back to Front view and load the Mk84 bombs.
6. At about two miles from the target, you'll see the nuclear facility. Lay the bomb sight on one of its towers and designate it as the target by pressing the spacebar.
7. Fly over the tower at 2000 feet.
8. Use Rear view to see if you got the target.
9. Turn around and make a bombing run at the second tower.
10. Leave the scene. Switch back to the Mavericks and make for the third waypoint.
11. At the third waypoint, turn back toward base.
12. Land safely, and then pull down the menu and choose File ➤ End Mission. Visit the debriefing to see how successful you were.

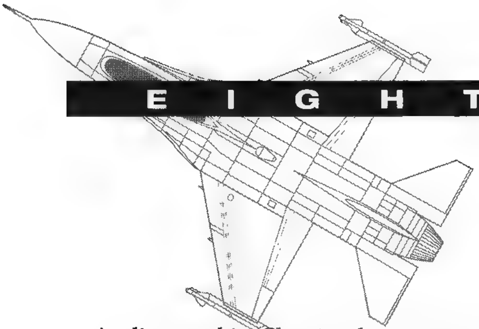
WARNING

You're now flying a real mission, and you may encounter friendly aircraft. Remember to use your IFF to check out the identity of aircraft you meet. Use the IFF as fast as possible so that the enemy (if such he be) doesn't stitch you up first.

CREATING YOUR OWN MISSIONS

EIGHT

EIGHT



As discussed in Chapter 6, you can create your own missions in Red Flag to practice the skills you'll need in combat. Creating your own missions is a vital skill for Campaign, where you'll be leading your own squadron and planning each mission that it executes. Chapter 9 discusses how to set up and win a campaign.

The first part of this chapter runs you through the basics of how to plan and create a mission. The second part takes a look at a couple of skills you'll need in Red Flag—fuel management and flying with wingmen. Finally, at the end of the chapter, you'll find details on how to access the missions on SYBEX's CompuServe forum.

DESIGNING A MISSION

In Chapter 6, we looked at the various screens of Red Flag and discussed what they're for. Now let's put together a mission to see how everything hangs together.

A LITTLE PLANNING NEVER HURTS

Before designing a mission, decide which skills you want to practice in it: Aerial combat? Bombing and strafing? Low-level flying? A little bit of everything mixed in together? This information will shape every aspect of the mission you create. Of course, you *can* just blunder along, adding elements here and there, but if you do, you stand a fair chance of ending up with some grotesque mishmash in which nothing ever happens—opposing patrols miss each other in the air, ground forces go nowhere and don't get to fight anybody, and there is a general air of incompleteness (rather like those Real Wars you see on the TV...). Then again, you might just manage to thrash together a blinder of a mission all unawares… but in general you'll do better with a firm plan. Hell, you didn't join the air force without knowing what you wanted to do, did you?

If you're short of ideas for missions to put together, pull out a pencil and a scrap of paper (all right, your Newton or Handbook, if you insist) and jot down the parts of your last five missions that you found hardest. Note down each time you died, went down, or even pulled a horrific wilson through ignorance, weakness, or your own deliberate fault—something you *never* want to do again. Now you're getting to the areas you need to work on.

Once you know what you're going to want to include in the mission, you're ready to design it.

GETTING STARTED

OK, let's fix us up an entertaining mission. As usual, start by selecting the squadron with which you'll fly from the War Room, and then click the Red Flag monitor to start Red Flag.

In Red Flag missions, you can decide each element that you and your wingmen will encounter. You can include various allied and enemy aircraft, and allied and enemy ground units such as SAMs, AAA batteries, tanks, infantry, artillery, and transportation. With such freedom of choice, you'll have no excuse not to train yourself and your pilots thoroughly.

As the Squadron Commander, you lead Flight # 1 of any mission, flying an F-16. You can assign any pilot you want to this plane, and how you perform in the mission will affect that pilot's scores.

In the coming sections, we'll create a mission that will cause a few sparks to fly. We'll bring in an enemy ground force on its way to take Las Vegas (yes, they took Manhattan and Berlin first) and a flight of MiG-29s to provide support and a few bombs for distraction—and to take out the runway at Nellis Air Force Base. To protect the city, we'll set up a patrol of F-16s. Then we'll see what happens….

The first thing you need to do is get to the Red Flag Control screen and click the Clear button to clear any existing data there. You'll be asked if you're sure. Sure? Sure you're sure! Press **Y**.

You'll see Falcon 3.0's default mission setup: one F-16 and one MiG-29 in the air, and an enemy route on the ground, all three traveling southeast (see Figure 8.1).

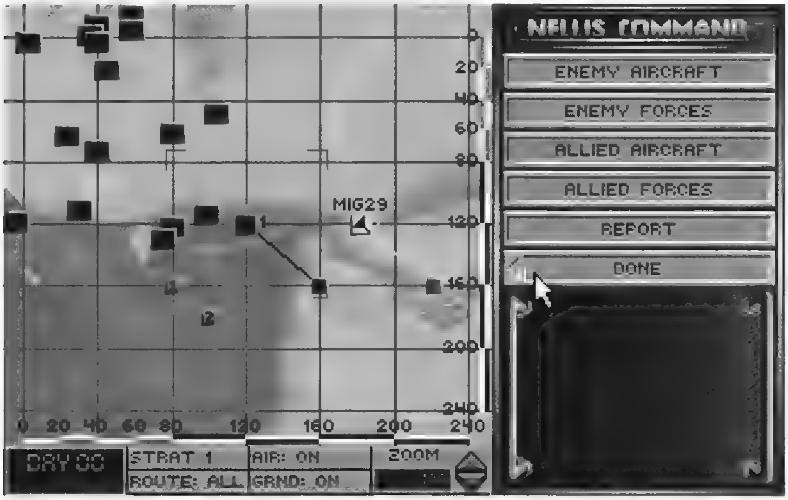


FIGURE 8.1 *This is Falcon 3.0's default mission setup—the coast is as clear as it's going to get. Now get to work.*

Click the Nellis Command button from the Red Flag Control screen to get to the Nellis Command screen.

In the Nellis Command screen, start by moving the enemy ground force into a suitable position. Take a look at Figure 8.2. You'll see that I've chosen Strat 1 view from the button panel below the map to give me a view of Las Vegas (a strategic position) and Nellis AFB (a tactical position), the grid, and the scale. I've increased the zoom to 8× so that you can see what I'm doing. I've brought the enemy ground force into

NOTE

Each mission you create *must* have at least one allied flight (yours) and one enemy flight. (If you want to do some training without being harassed, you can always arrange for the enemy to stooge about in some handily inaccessible area so they won't come bother you.) There don't *have* to be any ground routes involved, though you'll usually find it more entertaining if some are.

the middle of the map, and positioned its second waypoint just to the west of Las Vegas. (That's so you can see that Las Vegas is there. I'll move it right onto Vegas in just a second.)

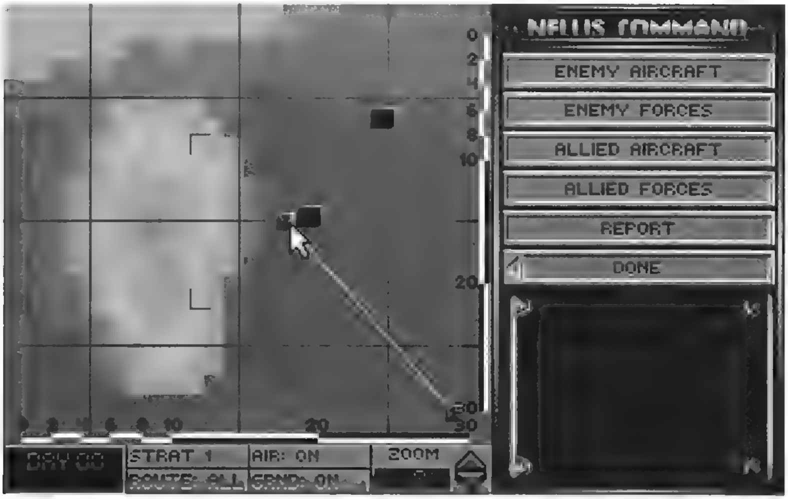
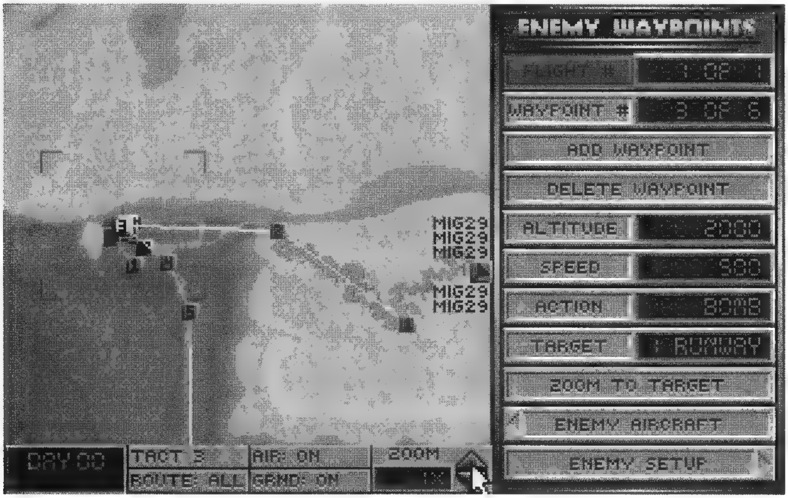


FIGURE 8.2 *Moving the enemy ground forces. I'm using Strat 1 view so that I can see both Vegas and Nellis.*

Next, move the allied and enemy air routes into suitable positions. In Figure 8.3, I've set up the rough route for the flight of MiG-29s to follow by dragging the start, first, and second waypoints into suitable positions. The MiGs will fly in from the east along the Grand Canyon, have a quick chukka at Nellis, visit Vegas briefly and scream along the Strip at zero feet, make a quick appearance in the Circus Circus by using Falcon 3.0's incredible zoom feature (just kidding), and then fly out south along the Colorado River. (So they're tourists; this is mission practice, remember. We might as well enjoy it. Them too.) Again, I've zoomed the view so that you can see what's going on, and this time I've switched the Ground routes off to get the enemy ground forces out of the picture for clarity.



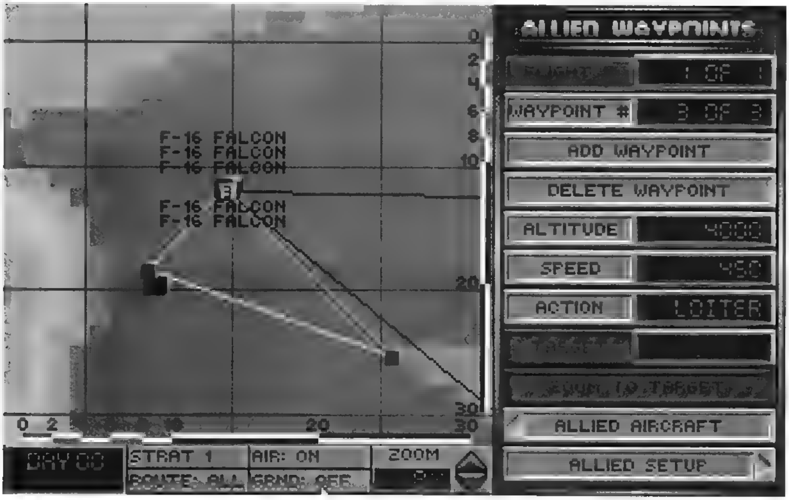
FLIGHT # 1 OF 1
WAYPOINT # 3 OF 6
ALTITUDE 2000
SPEED 980
ACTION BOMB
TARGET RUNWAY
DAY 00
TACT 3
ROUTE: ALL
AIR: ON
GRND: ON
ZOOM 1X

FIGURE 8.3 *Setting the initial route for the MiG-29s*

OK, time to put the F-16s in the picture. They'll be coming from Nellis AFB (surprise, surprise), just to the northeast of Las Vegas. Let's crank up the zoom and drag the allied air route into a suitable position. In Figure 8.4, I've pulled the start waypoint a little west of Nellis so that you can see where it is.

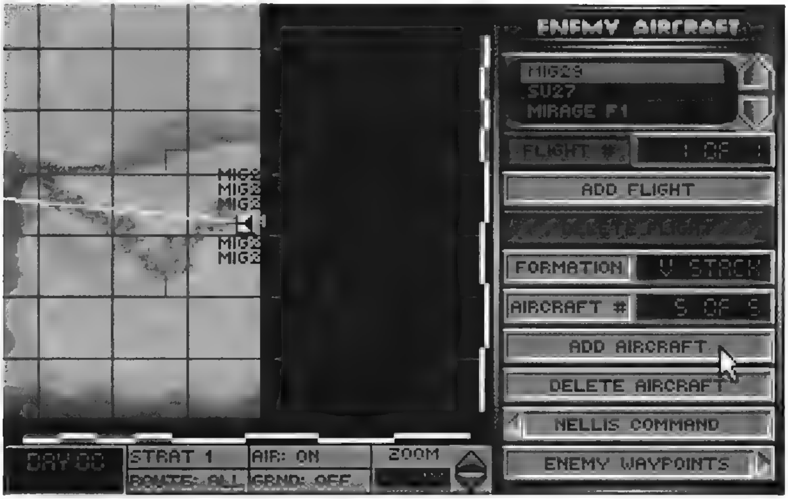
Now that we've done the initial work on the Nellis Command screen, we can set up the opposing air forces. First, the enemy. Click the Enemy Aircraft button on the Nellis Command screen to access the Enemy Aircraft screen.

To make this mission moderately balanced and fair, let's assign five aircraft to each side. In the Enemy Aircraft screen, make sure MiG-29 is selected on the monitor screen in the top-right corner, and then click the Add Aircraft button until the readout shows 5 of 5. Each time you click the Add Aircraft button, the map will register another MiG-29 at the start waypoint for the flight (see Figure 8.5).



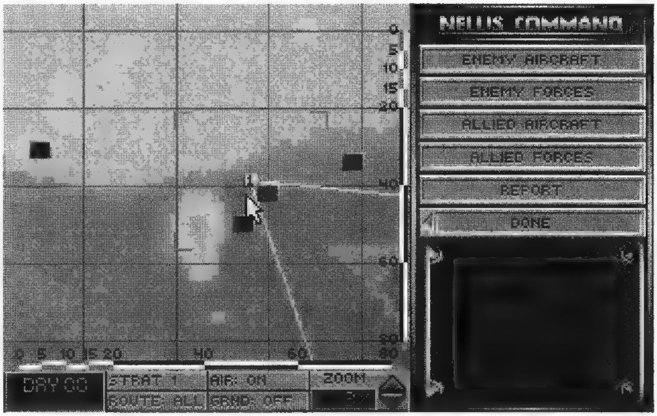
FLIGHT # 1 OF 1
WAYPOINT # 3 OF 3
ALTITUDE 4000
SPEED 450
ACTION LOITER
DAY 00
STRAT 1
AIR: ON
ROUTE: ALL
GRND: OFF

FIGURE 8.4 *Setting the initial air route for the allied aircraft*



FLIGHT # 1 OF 1
FORMATION V STACK
AIRCRAFT # 5 OF 5
DAY 00
STRAT 1
AIR: ON
ROUTE: ALL
GRND: OFF

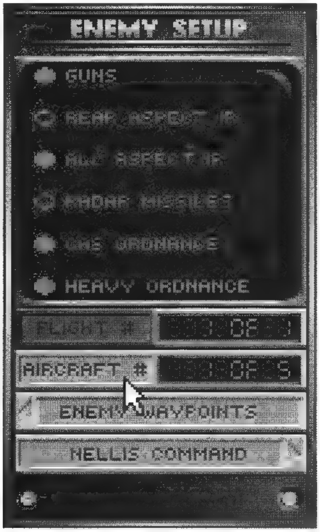
FIGURE 8.5 *Click the Add Aircraft button in the Enemy Aircraft screen to add the aircraft highlighted on the monitor to the flight shown.*



With that done, click the Enemy Waypoints button to reach the Enemy Waypoints screen. Since the MiG-29s are doing the tourist bit, I've given them waypoints along the canyon so that they get a good view (as illustrated here).

Next, we need to set suitable information for the various waypoints. In the following table, you'll see that I'm giving the MiGs nothing to do except the bombing run. But don't worry—they'll defend themselves when attacked. We'll set up the F-16s to be a little more aggressive in just a moment. After all, they're defending in this mission.

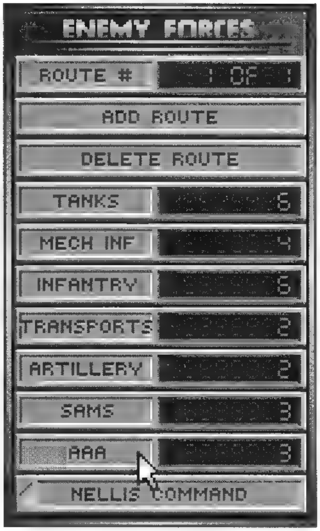
Waypoint	**Altitude**	**Speed**	**Action**
Start	12000	650	Nothing
1	8000	650	Nothing
2	6000	500	Nothing
3	2000	500	Bomb
4	4000	650	Nothing
5	8000	650	Nothing
6	12000	650	Nothing



Next, we'll quickly arm the MiG-29s on the Enemy Setup screen. Click the Enemy Setup button on the Enemy Waypoints screen to flip up the Enemy Setup screen. On this screen, select the Aircraft # button to choose the aircraft to arm, and then click the circles next to the weapons on the monitor. In the illustration, I've added guns, all-aspect infrared missiles, CAS ordnance, and heavy ordnance to the leader of the flight. I'll do the same for the other planes in just a second—*there*; all armed to the teeth, and mean and hungry as bears coming out of hibernation after a *long* winter.

Click the Nellis Command button on the Enemy Setup screen to return to the Nellis Command screen. Next, we'll assign the enemy forces. Click the Enemy Forces button to reach the Enemy Forces screen. Add a full complement of weapons by clicking the Tanks, Mech Inf, Infantry, Transports, Artillery, SAMs, and AAA buttons—say six tanks, four mechanized infantry, six infantry, a couple of transports and artillery, and three each of

SAMs and AAA—or what you will, just as you like it. The left mouse button increases the number; the right mouse button decreases it.

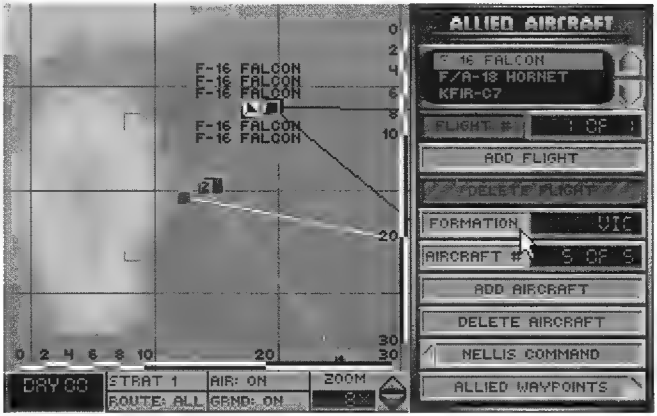


ROUTE # 1 OF 1
TANKS 6
MECH INF 4
INFANTRY 6
TRANSPORTS 2
ARTILLERY 2
SAMS 3
AAA 3

Click the Nellis Command button on the Enemy Forces screen to return to the Nellis Command screen and arrange the allied aircraft. Click the Allied Aircraft button to reach that screen.

On the Allied Aircraft screen, add four more F-16s to the one already designated for the mission by selecting F-16 Falcon on the monitor and clicking the Add Aircraft button four times. Change the formation to VIC by clicking on the Formation button to cycle through the options available.

Click the Allied Waypoints button on the Allied Aircraft screen to move to the Allied Waypoints screen. Here, we'll arrange for the F-16s to patrol so that the MiG-29s will run smack into them.



DAY 00
STRAT 1
ROUTE: ALL
AIR: ON
GRND: ON
ZOOM 8X
FLIGHT # 1 OF 1
FORMATION VIC
AIRCRAFT # 5 OF 5

Set up the allied waypoints as follows:

Waypoint	**Altitude**	**Speed**	**Action**
Start	4000	450	Nothing
1	4000	450	Search and Destroy
2	4000	450	CAP
3	4000	450	Loiter

This will set up the flight of F-16s to fly from Nellis to Las Vegas, search and destroy the enemy ground forces if they encounter them (nothing like a little suspense!), then swing southeast to the point of the canyon in combat-air-patrol mode, and then patrol between there and Nellis AFB until their fuel runs low, at which point they'll return to Nellis.

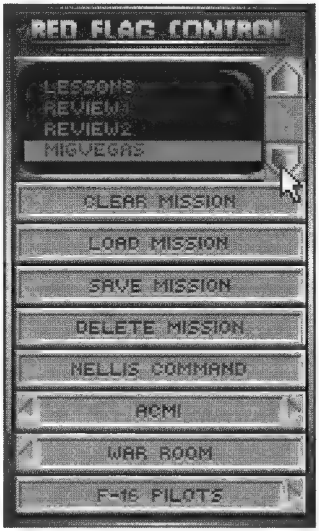
Now click the Allied Setup button on the Allied Waypoints screen to reach the Allied Setup screen. If we had any aircraft other than F-16s in the mission, we could arm them here. Since we don't, click the Nellis Command button to return to the Nellis Command screen.

If we wanted to add allied ground forces to the mission, we could do so by clicking the Allied Forces button and working in the Allied Forces screen. Again, we don't want to do that, so click the Done button to return to the Red Flag Control screen.

NOTE

For speed, you may sometimes want to modify an existing mission—for example, one of the preset missions with which Falcon comes—to make it different or more challenging, rather than creating a new mission from scratch. Once you've built a mission that works for you, consider making a bunch of copies of it and modifying each to make it a touch more difficult or more fun. (In case you're wondering, missions are saved in your \FALCON3 directory [assuming that's where you put Falcon 3.0 on your computer] with an RFM—think *righteous Falcon mission*—extension. You can copy or back them up like any other file by using DOS, the Windows File Manager, or your favorite desktop.)

Now save the mission by clicking the Save button and entering a name of up to eight characters, such as **MIGVEGAS** or something memorable. Press **Y** when Falcon 3.0 asks you if you're sure. The mission's name will then appear in the list on the monitor in the top-right corner of the Red Flag Control screen.



FLYING THE MISSION

To fly the mission we just created, click the F-16 Pilots button on the Red Flag Control screen. Choose your pilots as explained in Chapter 6, using the Pilot Information screen as necessary to help in your choice of pilots for the mission.

When you've finished choosing pilots, click the F-16 Armament button to go to the F-16 Armament screen. There, load weapons as described in Chapter 4. Make sure you load some Mk82s and some CBU-84 cluster bombs in case the F-16s come up against the enemy ground forces. You might also want to load centerline external fuel tanks so that the flight can loiter for longer. Since you know that the F-16s will be meeting the MiG-29s, you probably won't want to burden them with underwing external tanks—that might slow them down dangerously.

Once the F-16s are loaded for bear, you're all set. Click the Takeoff button and lead your flight on the mission. You may find yourself playing a waiting game until the MiG-29s arrive on their bombing run, but once they do, fireworks will ensue (see Figures 8.6 and 8.7).

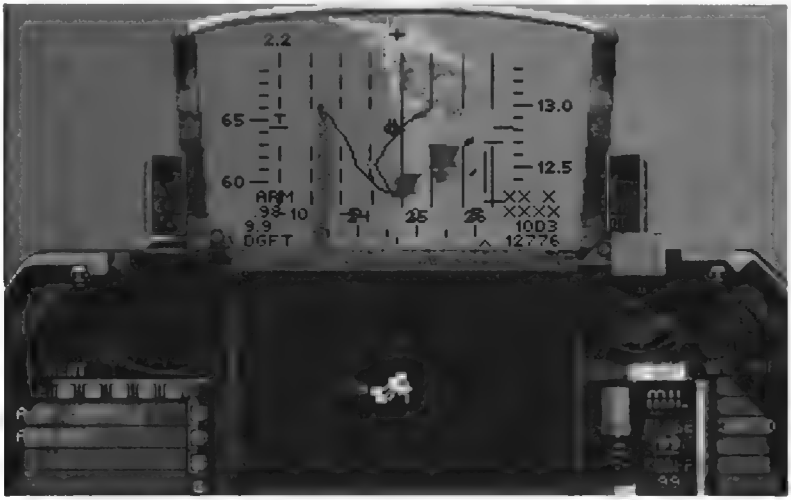


FIGURE 8.6 *Flying the mission*

FIGURE 8.7 *Another scene from the mission*

FLYING WITH WINGMEN

Additional aircraft you assign to your flight fly with you as *wingmen*. They are computer-controlled, like the enemy aircraft, so you can rely on them to take off and land, fly to waypoints (and perform the waypoint actions you set), use flares and chaff to defend themselves, and attack the enemy.

USING THE MAP CONTROLS

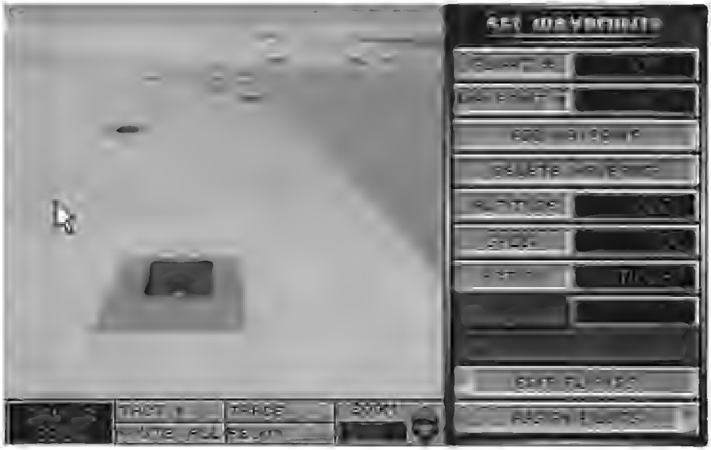
Here's how to use the map controls underneath the map.

Click the Tact/Strat button to display different information on the map:

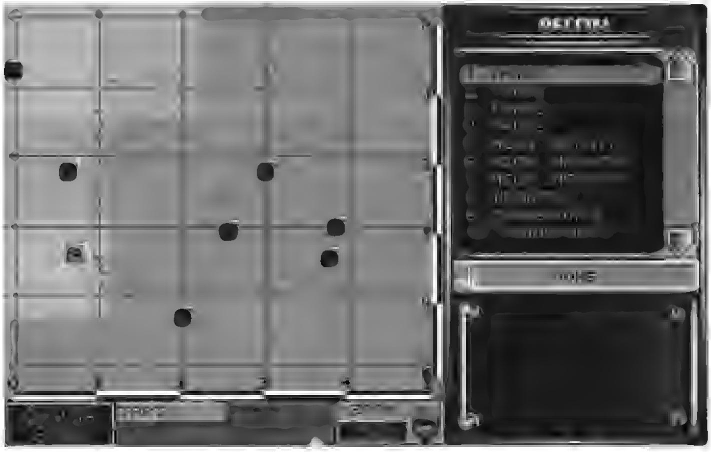
- Tact 1: home airfield and mission target; grid and scale
- Tact 2: home airfield and mission target, grid but no scale
- Tact 3: home airfield and mission target, neither grid nor scale
- Strat 1: friendly and enemy occupied key areas, grid and scale
- Strat 2: friendly and enemy occupied key areas; grid but no scale
- Strat 3: friendly and enemy occupied key areas, neither grid nor scale

Click the Route button to switch the display between one of the air or ground paths on the map and all of them. Click the Air button to toggle on and off the display of air routes. Click the Ground (GRND) button to toggle on and off the display of ground routes. Use the Route button together with the Air button or the Ground button to display the single route you want to work on.

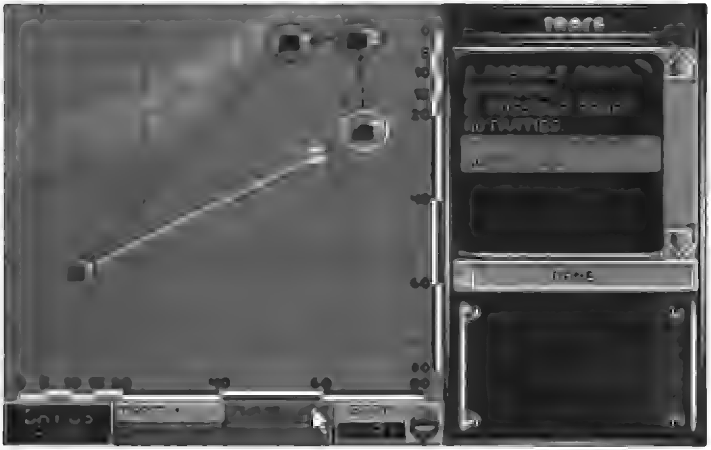
Click the Zoom buttons to zoom in and out on the map and locate your waypoints precisely. Clicking the Zoom buttons moves you through the various zoom increments: 1×, 3×, 8×, 20×, 50×, 120×, 250×, and then in smaller increments to 999×. You'll see that above 20×, the map shows a three-dimensional landscape, and above 250×, your angle of view becomes lower so that you can see the horizon. Once you've zoomed the view, you can click and drag with the mouse to move the display in the direction you want to view.



Click the Recon button to see an aerial reconnaissance of the map. Circles indicate the range of fire of anti-aircraft weapons. Plot your route accordingly.



When you're working in the Edit Flights and Set Waypoints screens, you can click the Trace button to have Falcon 3.0 check the flight path against known enemy threats and activities. You'll see the computer trace your flight route waypoint by waypoint, indicating threats along the way, as illustrated here.



The computer will identify air-defense radar installations and enemy fighter bases. The monitor will give you a description of each threat.

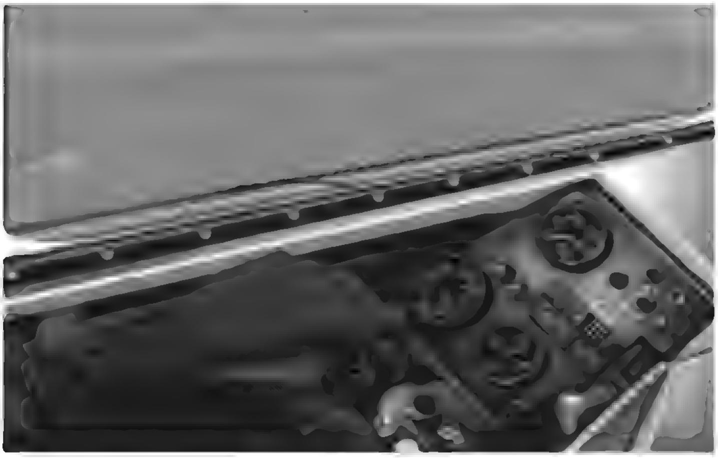
Click the Done button to leave the Trace display.

FUEL

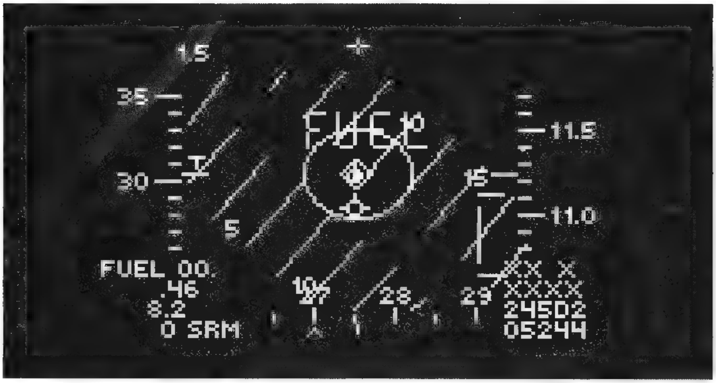
You'll want to include fuel management in some of your training missions so that you don't embarrass yourself severely in combat by having to turn back to base before reaching your target.

Remember that you have to have the Limited Fuel option turned on in the Difficulty Levels screen to get the true fuel experience. If you leave it turned off, you'll hear your wingmen squawking in desperation as their fuel runs out, while you fly blithely on . . .

The main fuel gauge is visible in Left view, as illustrated here. The gauge shows the amount of fuel left in *both internal and external* tanks, measured in hundreds of pounds. The internal tank holds 6950 lb. of fuel; the centerline external tank holds 300 gallons (roughly another 1900 lb.), and the wing-mounted external tanks hold 370 gallons each, or roughly 4800 lb. together. Fuel from the external tanks is used first so that you can jettison them when they're finished—press Ctrl+G to jettison the centerline tank, or any other store loaded there—or Ctrl+K to jettison all wing-mounted stores (anything mounted on the wingtips, such as Sidewinders or AMRAAMs, won't be jettisoned).



When you're running low on fuel, your F-16 will warn you that you're reaching your *bingo fuel point* (the point at which you have just enough fuel left to return to base if you head for base immediately) by flashing FUEL in the middle of the HUD.



WINGMEN'S GENERAL BEHAVIOR

In all waypoint actions except CAP, Intercept, and Search and Destroy, wingmen keep their radar on standby until they acquire a target visually, which they can do at about ten miles. Then they'll turn their radar on. But until your wingmen spot an enemy, you don't need to worry about them giving away your position to the enemy's threat warning indicators by using their radar.

Wingmen turn their ECM-jamming pods on when they are under attack and turn them off again when they're clear. You may find they're better about this than you are. Remember that if you hang out this EAT AT JOE'S sign, hungry MiG-29s will come cruising around in next to no time looking for easy meat.

On missions, you'll find yourself constantly receiving messages from your wingmen. Just a few notes on these:

- Any bearings they give you refer to your own aircraft. For example, if you hear *Bandit 6 o'clock!*, that's your six in danger, not your wingman's. (React accordingly.) By the way, a *stranger* is a good guy, so don't worry when you hear *Stranger 6 o'clock!*
- Wingmen don't distinguish between friendly and enemy radar contacts by using the IFF—they simply call out every one. Check the identity of the contact yourself before taking inappropriate action.
- In desperation, you can shut your wingmen up by using the Radio Silence command, **Shift+R**. You'll still see their messages displayed across the top of your screen—you just won't hear them.

RADIO MESSAGES FROM YOUR WINGMEN

You'll hear various messages from your wingmen, most of which fall into one of four categories.

- Information and warning: *Stranger/Bandit 9 o'clock! Clean Clear and Naked! Engaging! Enemy lock on! Radar Contact 234 degrees! Be advised fuel is low! Magic! Magic! Guns! Guns! Guns!*
- Acknowledgment of your commands: *Copy fence check! Copy disengage...will resume!*
- Refusal of your commands (*usually* for practical reasons, such as that following them would kill the wingman—for example, if you order a wingman to break downward when you're all flying too low for it to be possible, he'll refuse). *Kilo Mike Alpha!* (You

can work that one out from the initial letters.) ***I'm already engaged! I'm not engaged!***

- **Distress messages:** ***I'm hit! Ejecting!***
- **Success messages:** ***Smoked a bogie! Yo, your fries are done! Time to feed the worms, bud! That's all, folks! Hasta la vista, baby! Eat dirt, pal! Watch the canopy when you punch out, Jack!***

CONTROLLING YOUR WINGMEN

Your wingmen will fly in the designated formation with you unless they've got a good reason not to. Good reasons include their being under attack (or locked up) or your ordering them to make a maneuver.

Here's a list of what you can order your wingmen to do. Most of the commands apply only to the nearest wingman:

Shift+A	Break left (make a sharp horizontal turn to the wingman's left). After breaking left, a wingman will fly in that direction for a distance and then return to the formation.
Shift+D	Break right (make a sharp horizontal turn to the wingman's right).
Shift+W	Break high (climb sharply, fly level for a while, and then rejoin the formation).
Shift+X	Break low (dive sharply, fly level for a while, and then rejoin the formation).
Shift+S	Fly straight and level. Use this when you want your wingman *not* to perform the next maneuver you're about to. Try this when you've got enemies heading straight for you and you want to break to one side and outflank them.
Shift+B	Bypass the current waypoint.
Shift+V	Return to the previous waypoint.

Shift+R	Keep radio silence. (Note that issuing any other wingman command after this will start your wingmen talking again.)
Shift+Z	Bracket left (move out to the left for a while and then head back toward you). Use this to pincer an enemy between you and your wingman—tell the wingman to break to one side, break to the other yourself, and catch the enemy in the middle.
Shift+C	Bracket right.
Shift+E	Engage. Use this when one of your wingmen requests permission to engage and the encounter won't disrupt your mission or the threat is imminent. Remember that wingmen tend to be overenthusiastic about engaging the enemy, and don't send them out on every wild-goose chase they request.
Shift+Q	Disengage. Use this to tell the wingman you allowed to engage the enemy that it's time for him to come back. If you give this command at the wrong time, you'll hear a petulant *I'm not engaged*.
Shift+2	Drag left (turn to bring an enemy to the wingman's left rear position). In the drag maneuver, the wingman decoys an enemy into a suitable position for you to stitch him up. Make sure that you and your wingman are looking at the same target before you start a drag maneuver.
Shift+3	Drag right (turn to bring an enemy to the wingman's right rear position).
Shift+N	Ask AWACs for navigation information.

USING THE SYBEX COMPUSERVE FALCON MISSIONS

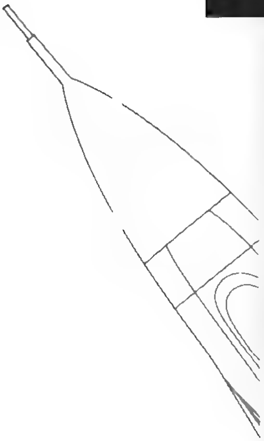
As I mentioned at the beginning of this chapter, SYBEX's CompuServe forum contains a bunch of missions and utilities—some for Falcon 3.0, some for MiG-29, and some for Hornet. Here's how to download them.

Fire up CompuServe with your favorite access program and choose GO SYBEX. In the Games library, you'll see a list of files that you can download, each identified by a title (1503-9 for the Falcon 3.0 files). Depending on the access program that you're using, you may also be able to see keywords and a description telling you what the files contain. The mission files are bundled into executable (.EXE) files so you can get more of them faster. Download the ones you want.

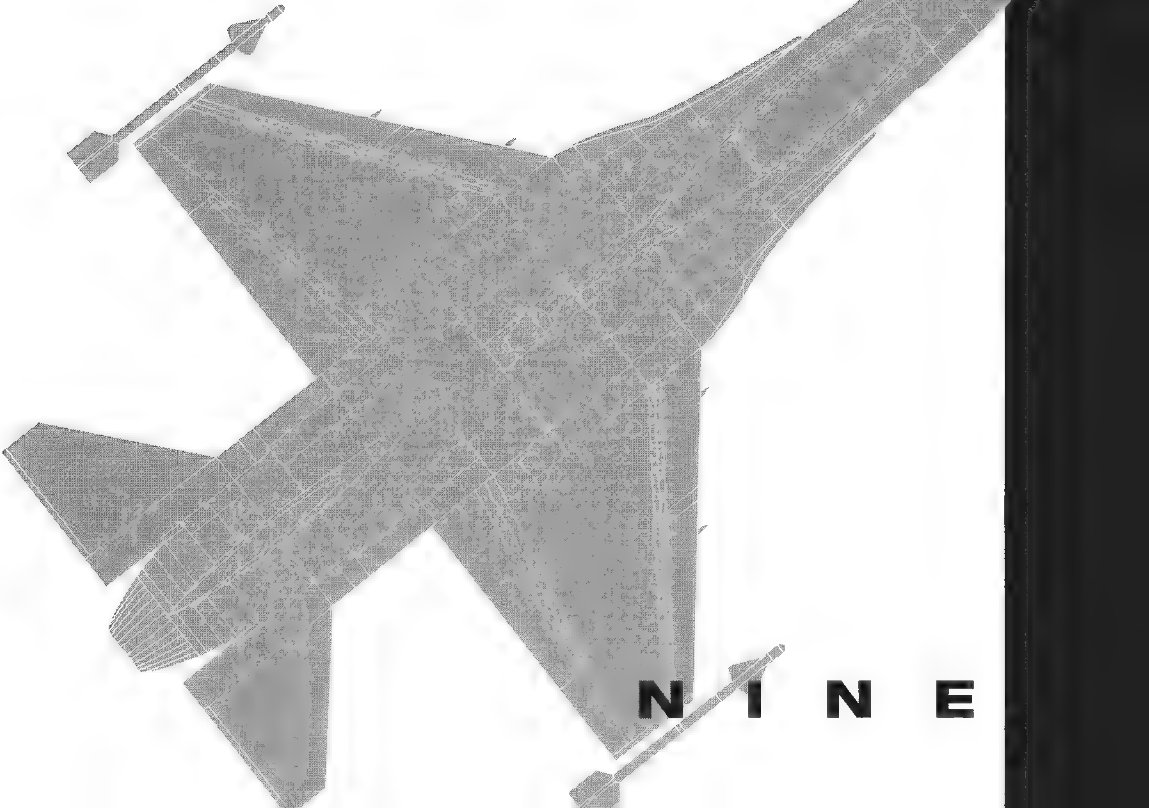
Once you've downloaded the files, run each executable file by typing its name at a DOS prompt or by double-clicking it in the Windows File Manager. Then copy or move the mission files to your FALCON3 directory. You'll then be able to load the missions from the list in Red Flag. (Note that you can only have 64 missions available at once in Falcon 3.0. If you're juggling vast numbers of missions, consider shifting the RFM files about between directories so that you never have more than 64 in your FALCON3 directory at once.)

PART THREE

CAMPAIGN



SETTING UP A CAMPAIGN



NINE

NINE

Falcon 3.0's Campaign module is where you can find out how much you've learned from fighting in Instant Action and practicing flying skills in Red Flag. Ideally, you should come to Campaign having achieved a considerable level of skill in Instant Action and Red Flag (more on this in a moment).

WHAT IS A CAMPAIGN?

In Falcon 3.0's Campaign module, you'll find yourself commanding a squadron of thirty pilots and eighteen planes taking part in a campaign against an enemy in enemy territory. You'll need to manage your squadron effectively by devising successful missions (planning the routes, flights, and aircraft taking part; assigning the right pilots for the mission; and assigning weapons to the aircraft), looking after your pilots, using your supplies effectively, and leading missions against the enemy.

In a campaign, Falcon 3.0 simulates four major elements of a real war: ground combat, air combat, supplies, and communications. You'll find ground troops trying to capture enemy territory (or to hold their ground against the enemy), supported by infantry and tanks on the ground and aircraft in the air. Your squadron will fly combat missions to help protect allied troops, disrupt enemy supplies and communications, and destroy enemy bases.

As a squadron commander, you'll be ordered by your superiors to carry out various missions. Your squadron will fly four missions each day: one in the morning (6:00 A.M.), one at noon, one in the late afternoon (6:00 P.M.), and one at night (11 P.M.) and in all kinds of weather, so you'll experience flying at night and in poor visibility.

You get to plan your squadron's missions, which gives you a big say in whether they succeed or fail. Falcon 3.0 supplies default settings for each mission, but you'll do well to change these, as we'll discuss in a second. You can assign up to eight pilots and four flights to a mission.

The success or failure of each mission affects the progress and the outcome of the campaign. For example, if you destroy a runway at an enemy airbase early in a campaign, thereafter you'll see fewer enemy aircraft in that area. On the other hand, if you screw up at the start of a campaign, you'll find yourself scrambling to make up lost ground—and if you lose most of your men and F-16s on the first day, you'll be in deep trouble until your resupply date, and then in hot water with your superiors.

Your squadron keeps flying its four missions a day until either all your aircraft (or pilots) are destroyed or the squadron is replaced.

In Campaign, you need to know the abilities of your men and their equipment, and the abilities of the enemy and *their* equipment, and how best to pit your men against the enemy. You need to keep track of supplies, or you'll find yourself trying to fly missions without any weapons.

OK, that's enough general jawing for the time being. You get the idea of what Campaign's about. If you're ready for Campaign, let's get right into it.

FIGHTING A CAMPAIGN

This section discusses how to start and run a campaign, and gives you a bunch of tips for success. I should stress that each mission on each campaign is unique, so it's not as if I could walk you through each mission (or campaign) one by one—as if I wanted to! I'll show you how Campaign works and point you in the right direction, but after that, you're on your own.

The first step in starting a campaign is to select the squadron you'll lead and the theater it will fight in.

PREPARING FOR CAMPAIGN

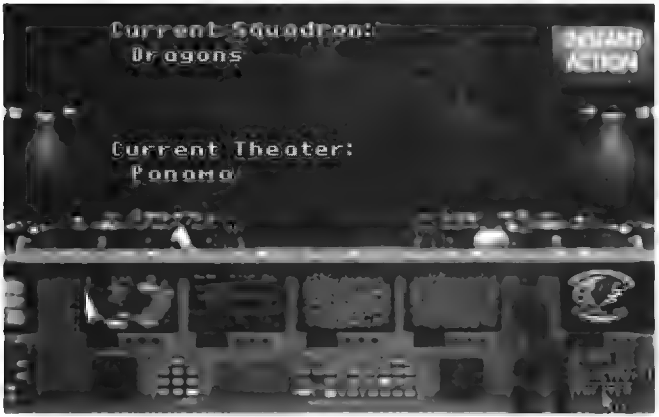
It's tempting to try plunging straight into a campaign as soon as you install Falcon 3.0 on your computer, but I'd recommend against it. If you dive into Campaign before learning the moves and skills you'll need in it, you're liable to take heavy losses and get discouraged—which would be a shame, since Campaign is in many ways the best part of Falcon 3.0. It's certainly the most challenging. Like, you'd learn to drive a car before entering a Formula One race, wouldn't you? Campaign's the same kind of deal—there's a whole bunch of stuff you need to know before you start.

So before you fire up the Campaign module, make sure you know how to do the following:

- dogfight
- attack ground targets
- navigate
- manage your fuel
- use your radar

Use Instant Action and Red Flag to learn these skills.

CHOOSING A SQUADRON AND A THEATER


Current Squadron:
Dragons

Current Theater:
Panama

To choose a theater for your campaign, go to the War Room, and then select the squadron you'll lead by clicking on the SQUAD monitor until the squadron you want appears on the World Map. (If you want to form a new squadron for the campaign, go ahead and do so.) When you've got the squadron selected, click the Theater button in the lower-right corner of the War Room until the theater you want appears on the World Map.

FALCON 3'S DIFFERENT THEATERS

Falcon 3.0E comes with three theaters of conflict: Kuwait, Israel, and Panama. Operation: Fighting Tiger adds three new theaters: Kashmir, Korea, and the Kurile Islands. MiG-29 fleshes out the picture by adding the other side in these six theaters: Iraq for the Kuwait campaign, Syria for Israel, Cuba for Panama, Russia for the Kurile Islands, North Korea for Korea, and India for Pakistan. Finally, Hornet adds Bosnia.

Chapter 10 discusses the new theaters in Operation: Fighting Tiger; Chapter 11 discusses MiG-29 and its theaters; and Chapter 12 discusses Hornet and the new dimensions it brings to Falcon 3.0.

STARTING THE CAMPAIGN

Once you've chosen your squadron and theater for the campaign, click the Commit button in the War Room to begin the campaign.

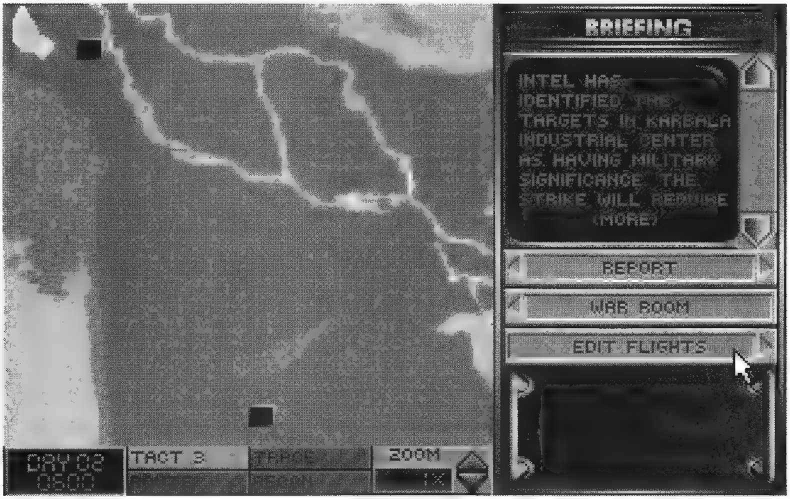
You'll see an overview of the campaign scroll down your screen, followed by a briefing for the first mission. This briefing will indicate the location of the theater (Kuwait, Panama, Israel, etc.); the time; the number of aircraft your squadron has available (18 to start with); and the number of pilots (30 to start with). These figures will be updated in subsequent briefings. Then you'll see weather reports indicating the current weather and tomorrow's forecast. Finally, the briefing will show you your squadron's resupply date (when your squadron will receive more weapons, fuel, and stores) and its replacement date (when new pilots and replacement F-16s will arrive at your squadron). Make mental notes of this information, because it'll affect your planning for each mission.

WARNING

Don't trust the forecast information too much—as in real life, the weather may change unexpectedly, and it can screw you up something horrible if you're not flexible. Be prepared to put contingency plans into operation when the weather changes. And don't rely too heavily on your replacement pilots and planes showing up when they're due—planes and pilots become scarce commodities in the later stages of a campaign.

USING THE BRIEFING SCREEN

Next, you'll see the Briefing screen (see Figure 9.1).



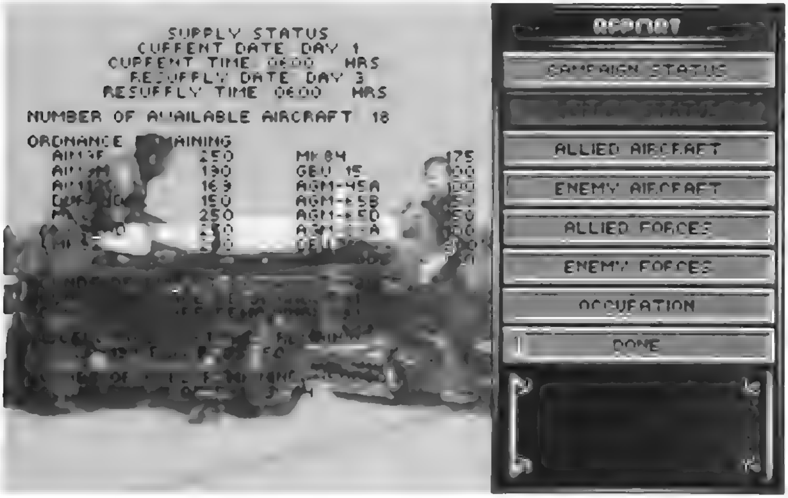
INTEL HAS IDENTIFIED THE TARGETS IN KARBALA INDUSTRIAL CENTER AS HAVING MILITARY SIGNIFICANCE. THE STRIKE WILL REQUIRE (MORE)

FIGURE 9.1 *The Briefing Screen brings you up to date with the current situation of the campaign.*

The video monitor in the upper-right corner of the Briefing screen gives you details of what's happening in the campaign and what your next mission is. Click the scroll arrows to read the rest of the briefing.

USING THE REPORT SCREENS

Click the Report button to move to the Report screens (see Figure 9.2). Here you can check out the Campaign Status, the Supply Status, Allied Aircraft, Enemy Aircraft, Allied Forces, Enemy Forces, and Occupation by clicking the appropriate button; the information will appear on the left side of the Report screen.



```
              SUPPLY STATUS
           CURRENT DATE DAY 1
         CURRENT TIME 0600   HRS
           RESUPPLY DATE DAY 3
         RESUPPLY TIME 0600   HRS

NUMBER OF AVAILABLE AIRCRAFT  18

ORDNANCE [illegible]AINING
   AIM-9[illegible]     250       MK 84      175
   AIM-9M     190       GBU 15     [illegible]
   AIM-120    169       AGM-45A    [illegible]
   [illegible]    150       AGM-65B    [illegible]
   [illegible]    250       AGM-65D    [illegible]
```

FIGURE 9.2 *The Report screens let you check the status of the campaign, your supplies, and the occupation. You can also crank up the mission computer to get details on the air and ground forces each side has.*

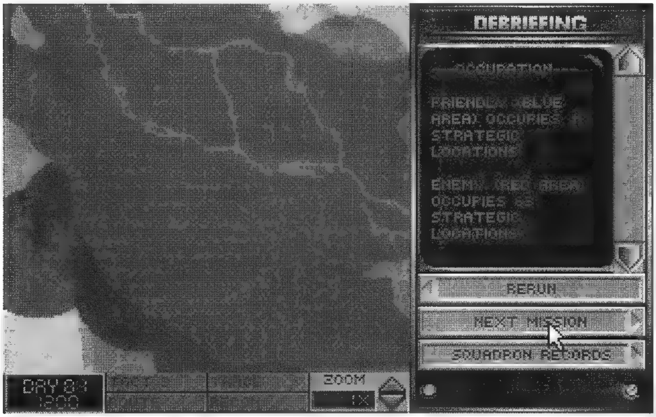
Here's a quick run-down on what these screens show.

Campaign Status shows you the current date and time, a campaign zone update showing how much of the campaign zone is occupied by the enemy and how much by the allies; your current mission; the number of missions flown, missions accomplished, and sorties flown (the number of missions flown multiplied by the number of aircraft that flew in them); the number of enemy aircraft shot down, divided into the six categories discussed in Chapter 6; the number of ground targets destroyed, divided into the four classes of target (also discussed in Chapter 6); the Ordnance Efficiency Rating of your squadron (how efficiently they've used their weapons); and the Overall Campaign Rating of the squadron (how well they're doing).

Supply Status shows you the current date and time; your resupply date and time; the number of aircraft your squadron has available; the amount of ordnance your squadron has remaining, broken down into the individual types of weapons (AIM-9P, MK82, etc.); your remaining stores of bullet, flare, and chaff; your miscellaneous stores remaining (ECM pods, external fuel tanks, etc.); and the number of pounds of fuel remaining, with the number of F-16s the remaining fuel will fill.

The **Allied Aircraft**, **Enemy Aircraft**, **Allied Forces**, and **Enemy Forces** buttons fire up the Mission Computer, displaying statistics on available aircraft or ground forces as appropriate, a picture of the item selected, and a 3-D model of it. Click the View buttons to move through the list of aircraft, tanks, etc., available; click the Scroll Text button to see more details on the current item. Click the Exit button to leave the Mission Computer and return to the Report screen.

The **Occupation** button displays a map of the theater with shading indicating how much of the territory is held by the enemy and how much by allied forces (see the illustration).



From the Report screen, you can move in several directions: Right now, you'll probably want to click the Done button to leave the Report screen and return to the Briefing screen; but you can also click the Edit Flights button to reach the Edit Flights screen, where you create your missions; or you can click the War Room button to exit the current campaign and return to the War Room to fit in a little more training before tackling a nasty mission.

EDITING THE MISSION

Before we get into the details of the Edit Flights, Set Waypoints, Assign Pilots, and Load Weapons screens, a quick word of warning about the default settings you'll encounter in Campaign:

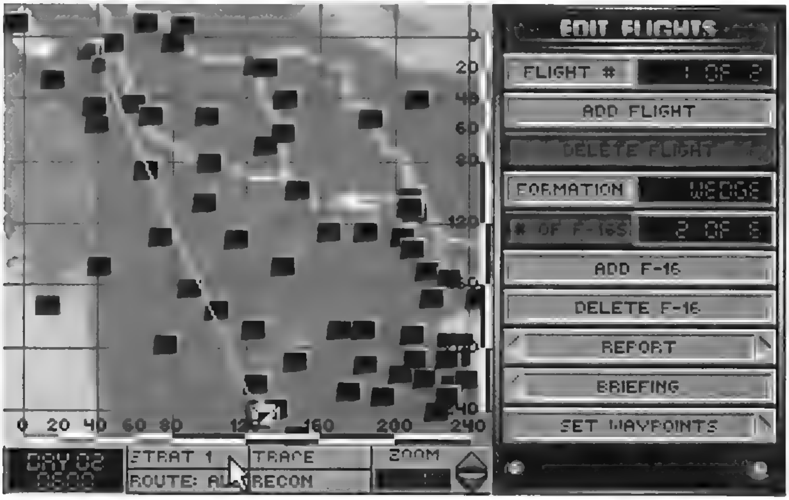
WARNING

Never **accept the default mission settings without examining them closely—you might live to regret it (or *not* live, as the case may be...). You'll often need to adjust the default settings to make your missions avoid hostile areas, to rest your pilots when they're fatigued from previous missions, or to compensate for a depleted supply of weapons (or aircraft) so that you don't run out of anything vital before your resupply date and time.**

Got that? OK, we're ready to get into the details of setting up the first mission. Click the Edit Flights button (if you didn't do so already) to get to the Edit Flights screen.

EDITING FLIGHTS

The Edit Flights screen (see Figure 9.3) looks very similar to the Allied Aircraft screen in Red Flag, and works in pretty much the same way.



FLIGHT # 1 OF 2

FORMATION WEDGE

OF F-16S 2 OF 6

FIGURE 9.3 *Use the Edit Flights screen to change the default flight and aircraft settings for the current mission.*

Use the Flight # button to select the flight you want to work with. Click the Add Flight button to add a flight; click the Delete Flight button to delete the currently selected flight. Use the Formation and # of F-16s buttons as you learned to do in Red Flag.

You'll see that the Add F-16 and Delete F-16 buttons have replaced the Add Aircraft and Delete Aircraft buttons—here you're commanding a squadron of F-16s only, so you can't assign other aircraft.

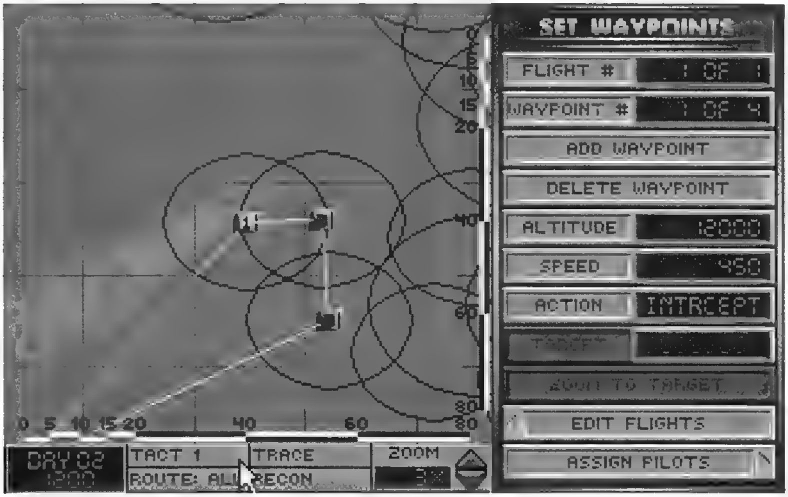
TIP

If your first flight is going on a bombing run, consider adding a flight of F-16s to escort them. Arm it with air-to-air weapons only—escorts shouldn't need bombs. Always assign at least two F-16s to any flight—never send anybody out alone unless you know the enemy's running low on hamburger and you're feeling generous. But remember that the wingmen in each flight follow the leader's maneuvers, so it may be better to assign two flights of two planes—flights with distinct objectives—than one flight of four planes. The number of aircraft mentioned in the briefing is the *minimum* number to use—feel free to use more if you've got the machines and men to spare.

When you've finished editing your flights, click the Set Waypoints button in the lower-right corner of the Edit Flights screen to move to the Set Waypoints screen. (You can also move to the Report screen or Briefing screen by clicking the appropriate button.)

SETTING WAYPOINTS

Use the Set Waypoints screen (see Figure 9.4) in Campaign exactly as you did the Set Waypoints screen in Red Flag: Click the Flight # button to choose the flight whose waypoints you want to change; click the Waypoint # button to select the waypoint you want to change.



FLIGHT # 1 OF 1

WAYPOINT # 1 OF 4

ALTITUDE 12000

SPEED 450

ACTION INTERCEPT

DAY 02 1200

TACT 1

TRACE

ROUTE: ALL RECON

FIGURE 9.4 *The Set Waypoints screen*

Click the Add Waypoint and Delete Waypoint buttons to add or delete waypoints (remember, the limit is eight waypoints per flight).

Use the Altitude, Speed, and Action buttons and readouts to set each flight's actions for each waypoint. Use the Target and Zoom to Target buttons for bombing runs.

To return to the Edit Flights screen, click the Edit Flights button. Otherwise, click the Assign Pilots button to move to the Assign Pilots screen.

WARNING

Watch out for lethal waypoints that Falcon 3.0's computer may set for you. The default mission waypoints tend to have a regrettable damn-the-torpedoes ethos that can prove briefly entertaining and permanently fatal. Use the Trace and Recon buttons to check out the proposed route, and don't be afraid to make changes. Aim to avoid enemy defenses rather than confronting them—like that wretched Chuck Norris deodorant commercial says, the best defense is not to give offense. Alternatively, set a decoy flight to run the gauntlet of the defenses while your flight sneaks around them.

ASSIGNING PILOTS

You assign pilots in Campaign's Assign Pilots screen (shown in Figure 9.5) just as you did in Red Flag: To change the default

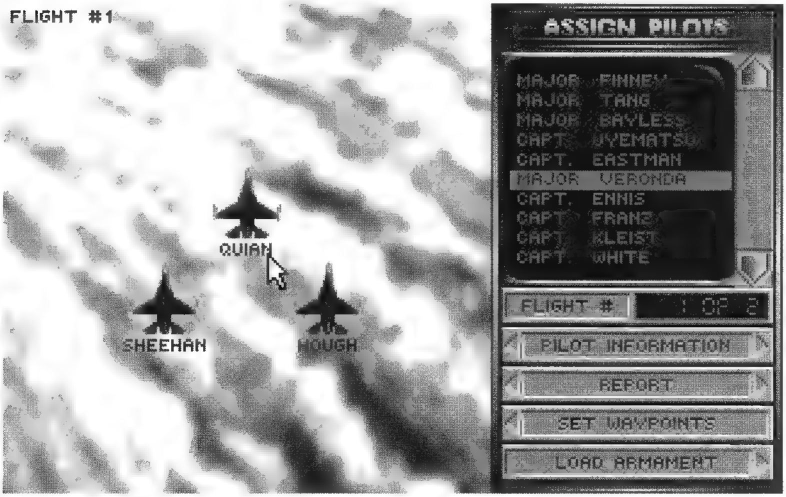


FIGURE 9.5 *The Assign Pilots screen*

pilots for a flight, click the name of the replacement pilot in the list on the monitor, and then click the F-16 to which to assign that pilot. Click the Flight # button to choose which flight to work with.

TIP

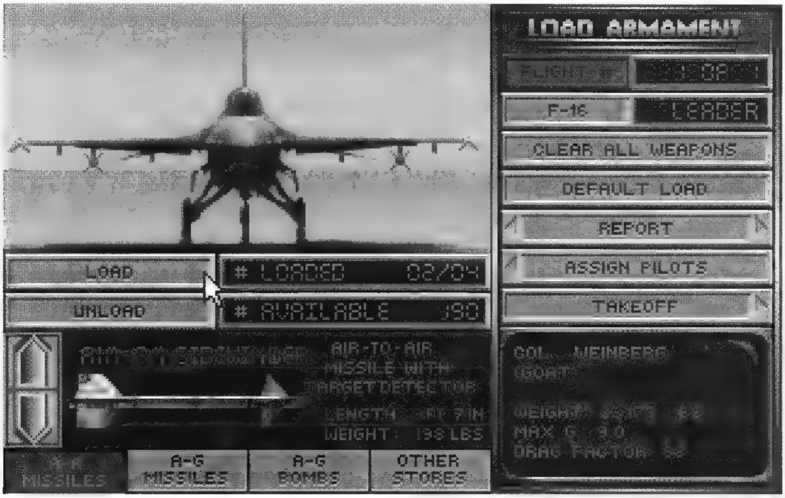
Remember that in Falcon 3.0 you can change the name, callsign, and face of any pilot in your squadron. Now, changing the face is unlikely to do much for you; but changing the name and callsign can be a great help to you in Campaign, when you need to remember the ability of each individual pilot before ordering one to perform maneuvers. To help you remember who can do what, customize the names and callsigns of the pilots who will be flying with you so that they stick in your mind. Use the names of your friends, your family, your dog, your car, or whatever. In desperation (and if it helps you), you can switch pilots about so that you'll always be flying with the same group of names or callsigns. This can help you remember who's which wingman, but it may screw up your total recall of which pilot has which skills.

You can click the Pilot Information button to get information on the pilots available in your squadron, or the Report button to see the status of the campaign, the supplies you have remaining, and so on. Make sure the pilots you choose for any given mission have the skills required— for a bombing run, pick pilots with proven skill at attacking ground targets; for intercept flights, pick pilots with good dogfighting skills and SA. Watch the Fatigue ratings of your pilots, and don't make any pilot fly too many missions a day. Send a man up on four missions a day, and pretty soon he'll be flying a wooden box six feet under. In most campaign situations, you'll have more pilots available than aircraft, so rest pilots when you can. A pilot should be able to fly ***one*** mission a day without his fatigue rating increasing. If you require a pilot to fly two or more missions a day, rest him for more than one day. Weigh the pros of pilot ability against the cons of fatigue when assigning pilots to missions.

When you've finished assigning pilots, click the Load Armament button to reach the Load Armament screen. (If you need to change waypoints after selecting the pilots for the mission, click the Set Waypoints button to return to the Set Waypoints screen.)

LOADING ARMAMENT

Use the Load Armament screen (see Figure 9.6) to load the F-16s in each flight with suitable munitions for the mission.



LOADED 02/04

AVAILABLE 190

AIR-TO-AIR MISSILE WITH TARGET DETECTOR

WEIGHT: 198 LBS

COL. WEINBERG

FIGURE 9.6 *The Load Armament screen*

Use the Flight # and F-16 buttons and readouts to choose which F-16 to work on, and then load and unload weapons as discussed in Chapter 6. Remember that each F-16 will have a default load already (supplies permitting, of course), so you don't have to start from scratch. But it's vital that you set up each flight with the weapons it needs to complete the task you've given for it. When organizing complex missions, it's easy to lose track of which flight is doing what. If in doubt, return to the Edit Flights screen or the Set Waypoints screen and check what's going on.

WARNING

Remember to add external fuel pods for long missions—*and* to load them for each aircraft that needs them. *Very* embarrassing to run out of fuel and have to turn back before you reach your destination.... And don't forget that ECM jammers and anti-radiation missiles can be life-savers *even though* they reduce the number of other munitions your F-16s can carry. Swings and roundabouts... but *live* pilots and partially successful missions are worth much more to you in the long run than dead pilots and partially successful missions.

Since each F-16 in any given flight has the same objectives (governed by the waypoints you set), you can speed up the loading of weapons by copying the leader's weapons load to the other F-16s in the flight. To do so, set up the leader as usual, and then copy his weapons to each wingman by selecting the wingmen in turn (by using the F-16 button) and clicking the Copy Leader button (this button is the Report button when you're working with the leader of a flight).

TIP

To get an overview of all the weapons you have left at your disposal, make sure the leader of a flight is selected, click the Report button to get to the Report screen, and then click the Supply Status button. This is easier than going through each category of weapons one by one in the Load Armament screen to see what's left.

Once you've finished loading each F-16 in the squadron, you're ready for takeoff. Click the Takeoff button to reach the runway.

FLYING YOUR MISSIONS

Once you're on the runway, the mission is in your hands. As I mentioned at the beginning of this chapter, each mission in each campaign is different, and how you fly each mission affects the other missions in the campaign. Take a moment to settle yourself and review your objectives; then take off, check that your wingmen have joined you, and head for the first waypoint.

As mentioned in the previous chapter, your wingmen will usually keep their radar on standby and rely on acquiring enemy aircraft visually at up to 10 miles—so don't rely on them to pick up distant threats. Use your own radar to spot any problems before you reach them (see Appendix B for instructions on using the High Fidelity Radar mode) so that you can take evasive action if necessary.

Once you've carried out your mission successfully, turn around and head for home. Keep your wits about you—getting yourself and your wingmen home safely is a large part of the challenge of Campaign.

Should things go horribly wrong on a mission—for example, if a dogfight drags you outside bingo fuel range or some mother perforates your fuel tank, you can land at other airbases in the area. If you land at an enemy airbase, it's POWsville for you for the rest of the campaign; so you'll do better to identify friendly airbases before starting your missions so that you'll know where to put down in an emergency. (Quick reminder: Enemy airbases will appear red on the campaign map, while friendly airbases are blue. Bear in mind that enemy and friendly airbases will look the same once you're in the air.)

NOTE

At times in Campaign you may get, like, *vexed* at how things are going—say, on the way back from a mission on which the enemy have taken out all your wingies—and be tempted to take a *Death Wish 5*-style run at something on your way back. There's nothing to stop you, right? Right—*ish*. You need to remember that your theater commander is deciding the objectives for your squadron, and your responsibility is to carry out your orders. Now, while that doesn't preclude shooting up enemy targets on top of those that you've been assigned, be aware that destroying extra targets won't help your side in a campaign. So in effect you're risking your six for nothing. And (the clincher) even in Falcon 3.0, you can be court-martialled for negligent use of weapons. Self-restraint is the best policy: You are, after all, a highly trained professional. There'll be plenty more missions to fly, with lots of targets to waste, if you keep your cool and obey your orders.

ABORTING A MISSION

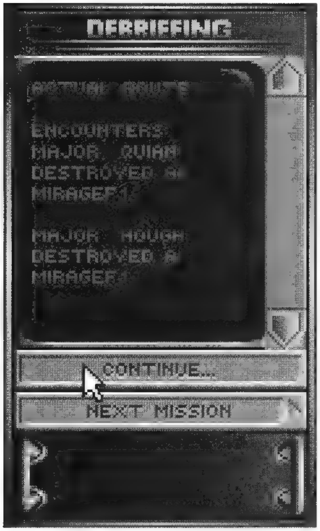
You can (ahem!) abort a mission at any time if you think it's not going well enough for posterity. Maybe you made an embarrassing or fatal mistake in the air, or maybe you simply pulled a wilson and forgot to load those external fuel tanks on your wingmen before starting a long-distance mission. Falcon 3.0 will forgive you, even if your conscience won't. Press Esc to pop up the menu bar, choose File ➤ Abort Mission, and press **Y**. Falcon 3.0 will return you to the War Room. To try the mission again, click the Commit button in the War Room and you'll find yourself back where you were before.

WARNING

Don't relax your guard just because you've called it a day and are returning to base. The enemy has been known to lurk about waiting for unwary F-16s out of fuel or stores—they make easy targets.

ENDING A MISSION

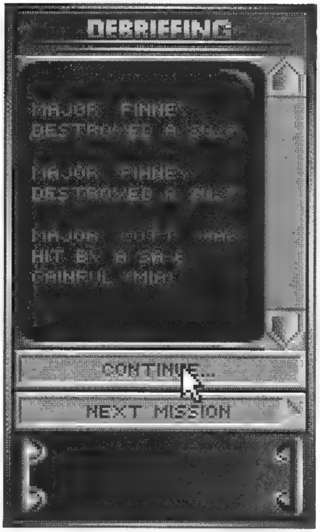
At the end of a mission, choose File ➤ End Mission and press **Y** to end the mission. You'll see the Debriefing screen shown



[illegible]

ENCOUNTERS:
MAJOR QUIAM
DESTROYED A
MIRAGEF1

MAJOR HOUGH
DESTROYED A
MIRAGEF1



MAJOR FINNE
DESTROYED A [illegible]

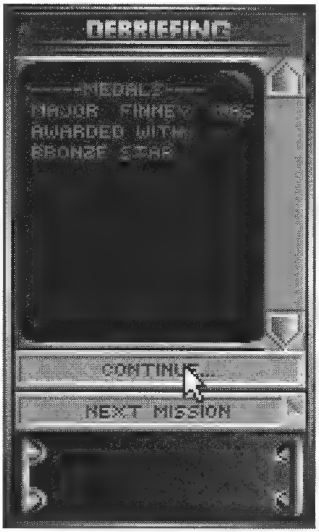
MAJOR FINNE
DESTROYED A [illegible]

MAJOR [illegible]
HIT BY A [illegible]
[illegible]

at left. Click the Continue button to see the details of how the mission went. The Debriefing screen will show you any encounters along the course of the mission, and will provide details on the screen of each action (as shown at right).

The Medals readout on the Debriefing monitor will show you any medals awarded (as shown here).

Finally, you'll see a Mission Summary that indicates whether the mission was a success or a failure and details enemy and allied losses of aircraft and ground forces. Scroll through the details if necessary. Then you'll see the Pilot Status for all the pilots involved in the mission. Figure 9.7 shows the debriefing for a successful mission.



——MEDALS——
MAJOR FINNEY WAS
AWARDED WITH
BRONZE STAR

Figure 9.8 shows the debriefing for a mission that, er, didn't go *quite* as well.

Finally, you'll see details of the current state of occupation of the territory, showing how many of the strategic locations the allied and enemy forces currently occupy (see Figure 9.9).

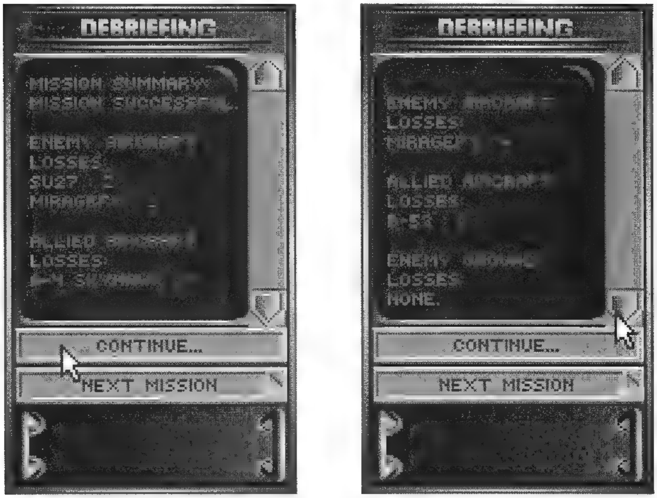


FIGURE 9.7 *The debriefing for a successful mission: the mission summary (left) and details of enemy and allied losses (right)*

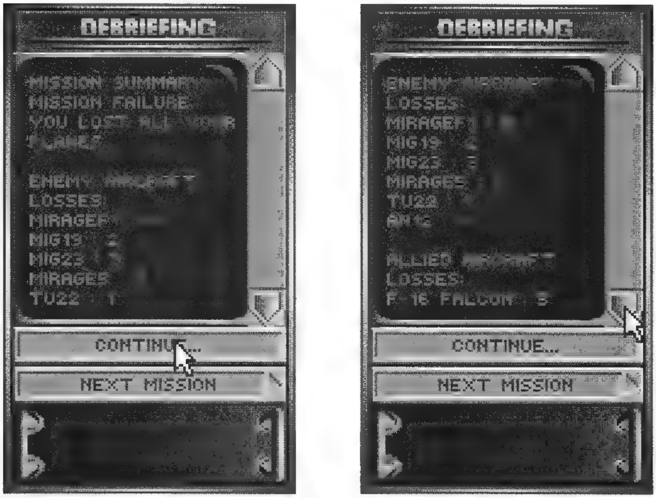
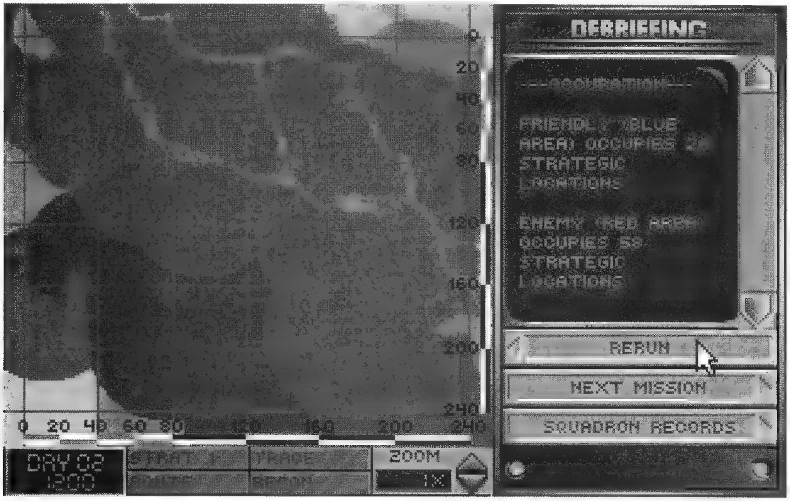


FIGURE 9.8 *The debriefing for an unsuccessful mission*



---OCCUPATION---

FRIENDLY (BLUE AREA) OCCUPIES 2[illegible] STRATEGIC LOCATIONS

ENEMY (RED AREA) OCCUPIES 58 STRATEGIC LOCATIONS

FIGURE 9.9 *At the end of the debriefing, you'll see an update of the occupation of the territory.*

TIP

Your squadron needs to complete three successful missions per day to increase allied offensive strength. This doesn't give you much margin for error—so don't take unnecessary chances.

The Occupation map shows the current status of territory in the campaign by showing it shaded in different colors: red for hostile (enemy-held) territory, blue for friendly (allies-held) territory. You can keep track of your success or failure by watching the friendly area grow or shrink after each mission.

If you missed any of the details, you can rerun the debriefing by clicking the Rerun button.

STARTING YOUR NEXT MISSION

When you're ready for the next mission, click the Next Mission button. You'll see a new briefing downloaded from the satellite, and then you'll be returned to the Briefing screen to start the new mission.

EXITING FROM CAMPAIGN

To exit from Campaign, click a War Room button in any of the screens that provides one. From the War Room, you can quit to DOS or go train in Falcon 3.0's other modules to prepare yourself for future missions.

RESTARTING A CAMPAIGN

To restart a campaign, simply choose the right squadron in the War Room and click on the Commit button. You'll see an updated briefing and then the Briefing screen.

ABORTING A CAMPAIGN

If a whole campaign is completely fubar (if you know what I mean and I think you do), you can abort the whole thing by selecting a different theater in the War Room. Falcon 3.0 will warn you that you're about to trash your data in case you clicked the Theater button by accident.

A more extreme measure is to click the Deactivate button in the War Room, which will trash all campaign and squadron information. Again, you'll get a warning first in case you didn't really mean it.

HOW A CAMPAIGN ENDS

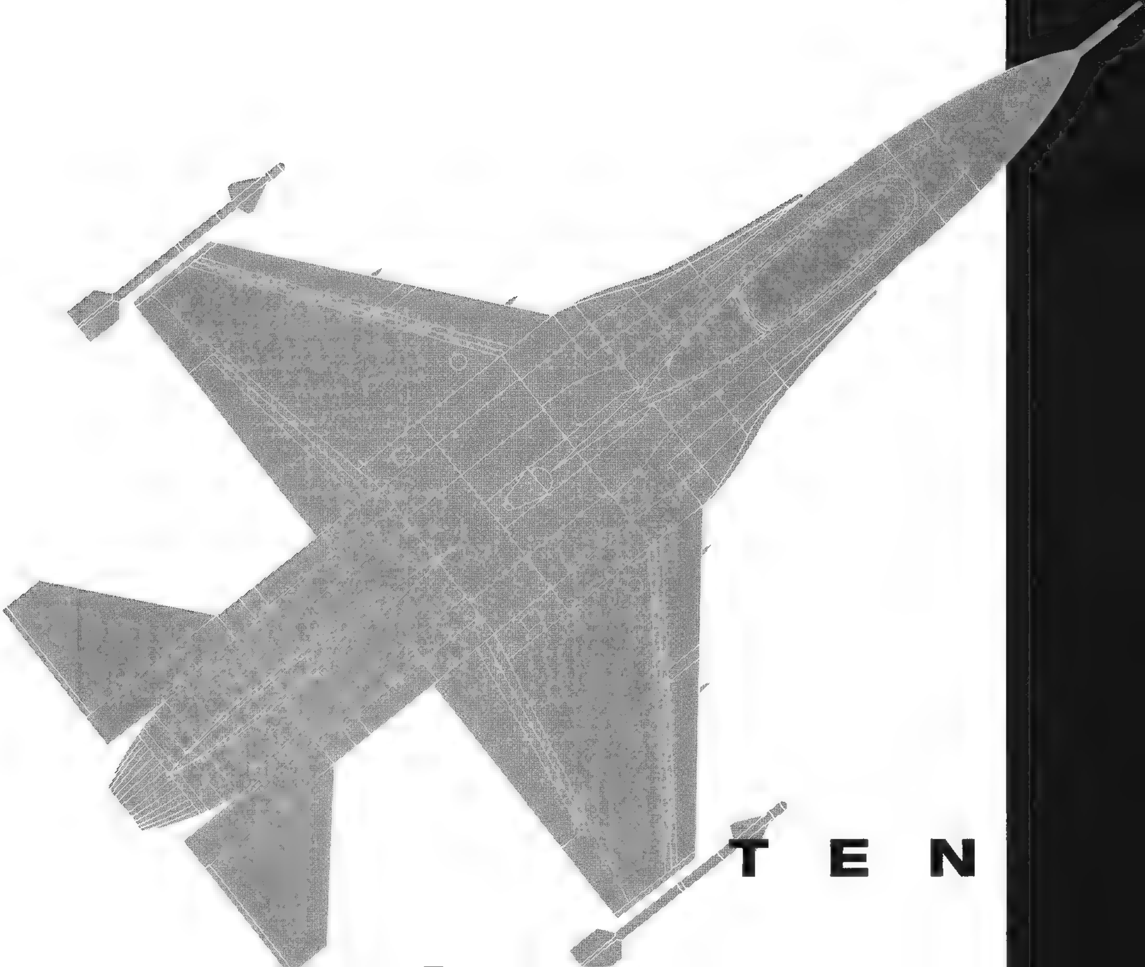
A Falcon 3.0 campaign continues until it ends in one of four ways. Each depends on control of the *victory nodes* identified by the theater commander at the beginning of the campaign. Since you don't control these victory nodes, we won't get deeply into them; but here are the four outcomes:

- victory for the allied forces, when they reach their campaign objectives (controlling at least 70% of the campaign nodes that the allied commander identified as victory nodes)
- defeat for the allied forces, when the enemy forces reach their campaign objectives (controlling at least 70% of the victory nodes at the end of the campaign)

- ceasefire, when neither side controls 70% of the victory nodes
- total, complete, and utter annihilation of your squadron (and eternal disgrace upon the head of the squadron leader, etc., etc.)

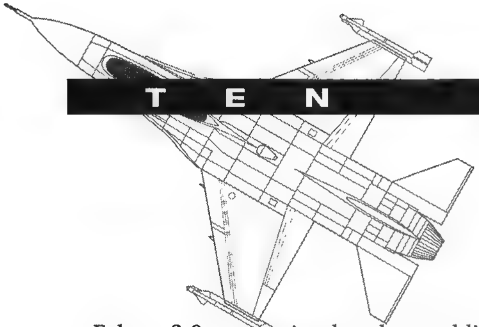
You can keep track of the progress of the ground forces by viewing the Occupation map regularly, as discussed earlier in the chapter.

FIGHTING THE CAMPAIGNS IN OPERATION: FIGHTING TIGER



T E N

TEN



Falcon 3.0 soon gained such an addicted following that the three campaign areas provided weren't enough. Falcon 3.0 fans demanded more, and Spectrum HoloByte responded with Operation: Fighting Tiger, which brings to Falcon 3.0 three new theaters:

- Korea, bitterly divided between communist North Korea and South Korea since the Korean War (fought from 1950 to 1953)
- Kashmir, the province of the Indian subcontinent to which both India and Pakistan lay claim
- the Kurile Islands, the chain of islands lying between Hokkaido, the northernmost of Japan's four main islands, and the easternmost outposts of what used to be the Soviet Union

Operation: Fighting Tiger further adds to the challenge of Falcon 3.0 by adding new aircraft, new weapons, naval task forces, and new missions.

NOTE

In the Kurile Islands theater, you'll be operating under specific rules of engagement that will be spelled out in the briefing before each mission. For example, you may be told "You may defend friendly assets against hostile air forces." Be careful not to overstep the rules of engagement and escalate the conflict. (If you do start to do something you shouldn't, AWACS will warn you that you are violating the rules of engagement.)

INSTALLING OPERATION: FIGHTING TIGER

Installing Operation: Fighting Tiger on your computer upgrades your copy of Falcon 3.0 to Falcon 3.01. (See Appendix A for instructions on installing Operation: Fighting Tiger, Falcon 3.0, MiG-29, and Hornet.)

WARNING

If you're adding Operation: Fighting Tiger, MiG-29, and Hornet to your installation of Falcon 3.0, you must add them in the right order to avoid screwing things up—first Operation: Fighting Tiger, then MiG-29, then Hornet. Each simulation carries patches to update the files in the previous ones, and writing patches over later versions of files can stop your copy of Falcon 3.0 from running. If you add Operation: Fighting Tiger after MiG-29, or MiG-29 after Hornet, you'll end up having to reinstall everything from Falcon 3.0 onward—a slow process.

Once you've installed Operation: Fighting Tiger, you'll be able to access the new missions and campaigns in the same way as those in Falcon 3.0. Load Falcon 3.0 by changing to the FALCON3 directory (**CD FALCON3**) and typing **FALCON3** at the DOS prompt. You'll know that Operation: Fighting Tiger is successfully installed because the opening screen of Falcon 3.0 will have *Operation: Fighting Tiger* stamped across it.

CONTROLLING OPERATION: FIGHTING TIGER

In Operation: Fighting Tiger, nearly all the cockpit controls and the Campaign screens work the same as in Falcon 3.0, so you'll have no problems organizing your missions and flying them. There are three new wingman commands, which we'll look at toward the end of this chapter.

AIRCRAFT IN OPERATION: FIGHTING TIGER

In Operation: Fighting Tiger's Kurile Islands campaign, you get to fly the FSX, a modified version of the F-16 that's used by the Japanese Self-Defense Forces. You also get to meet a whole bunch of other aircraft, some friendly and some not.

Here's a quick rundown of the new aircraft you'll see in Operation: Fighting Tiger. For dimensions and to see what they look like, check out the Report screens in Red Flag and Campaign.

The **MiG-31 Foxhound**, a Class A fighter used by the Russian Republic, is a dedicated interceptor with a fearsome radar capable of detecting an enemy at over 150 nautical miles (nm) and of engaging six targets simultaneously. The Foxhound can carry up to eight of the lethal long-range AA-9 Amos missiles (details coming up), but it usually carries a partial load of Amos missiles and a number of short-range missiles for use in dogfighting. Its top speed is Mach 2.4, it has a huge combat radius (1135 nm), it carries a crew of two, and it can reach 60,000 feet.

The **Mirage 2000**, a Class A fighter used by India, has tremendous flight performance (Mach 2.35 and a swift rate of turn) but a short combat radius (435 nm). It can carry up to eight air-to-air missiles and has two 30-mm cannons.

The **F-5E Tiger** is an outdated Class B light tactical fighter used by South Korea. Its low top speed (Mach 1.6), short combat radius (125 nm), and its underwhelming armament make the F-5E a weakish performer. But don't discount the Tiger too soon—it can match the F-16 in a turning fight, and when flown by a capable pilot, it can do as much damage as a MiG-19.

The **J-7 Airguard**, a Class B fighter used by Pakistan and North Korea, is a Chinese improvement of the MiG-21 Fishbed. It can reach Mach 2.05, carries only a pilot, and has a combat radius of 324 nm.

The **Q-5 Fantan,** an attack aircraft fashioned by the Chinese out of the MiG-19, is used by Pakistan and North Korea. It has a combat radius of 324 nm and can carry up to 4400 lb. of ordnance.

The **Jaguar**, an attack aircraft used by India, can carry up to 20,000 lb. of ordnance and fuel—enough to do quite a bit of damage. The Jaguar has a combat radius of 460 nm and is usually used for air-to-ground missions.

The **Mitsubishi F-1** is an attack aircraft used by Japan. Designed for air defense, land attack, and anti-ship work, the F-1 has a short combat radius (250 nm) and a very short maximum range (750 nm).

Now let's look at the FSX, which I'll bet is the plane you're most interested in.

FLYING THE FSX IN THE KURILE ISLANDS THEATER

The FSX is the Japanese F-16 variant due to be produced from 1999 to replace the Japanese F-1 fighter. (The Kurile Islands conflict takes place after 1999.)

If you liked the F-16, you'll love the FSX, because it's one mean mother of a fighter. It's a fraction longer than the F-16 (16 inches, to be precise), has larger wings that generate more lift, and the engine (fed by an enlarged fuel tank) produces 4000 lb. of extra thrust. The FSX will carry nine tons of weapons and hit Mach 2 at full stretch. You can also chuck it about more than you could the F-16 because it has a positive-pressure breathing system (basically, air being pumped into the pilot) that helps you counteract G forces—in fact, you should be able to pull high Gs for twice as long as you could in the F-16 before you red out or black out.

A couple more things to note about the FSX: It's designed for maritime and air attack, so the engine is tuned for low-altitude performance. Bear this in mind when setting waypoints for your missions—and of course when flying them. Also, the FSX's stronger airframe means it can withstand more punishment than the F-16 could. This may save your six from time to time, but it isn't an excuse to indulge in the dogfighting equivalent of Thai boxing.

The only difference to the HUD and cockpit that you'll see is that the FSX has a sea-scanning (SEA) radar mode for use with the Harpoon missile (see Figure 10.1). (We'll get to the Harpoon in a moment.)

TIP

You can switch to SEA mode manually by pressing F4. To turn SEA mode off, select a different radar mode.

ATTACKING SHIPS WITH THE HARPOON

In Operation: Fighting Tiger, you'll find yourself attacking ships from air-cushion landing craft all the way up to aircraft carriers.

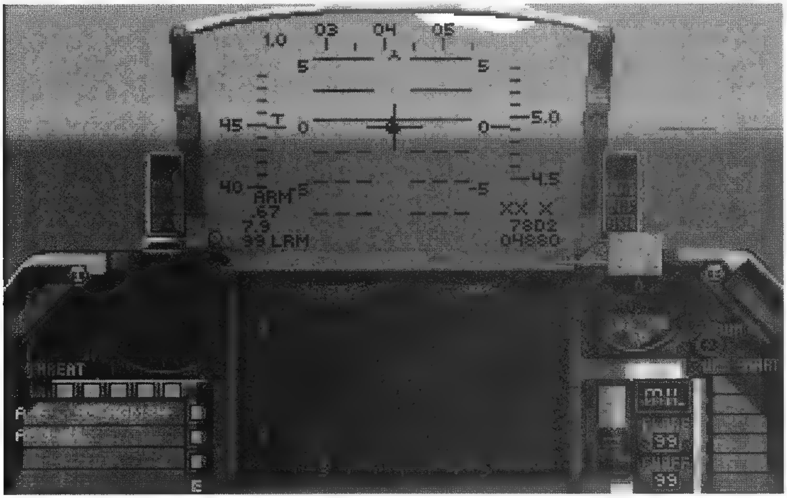


FIGURE 10.1 *The FSX cockpit in the SEA radar mode*

Your primary weapon against ships is the Harpoon, a long-range anti-ship missile featuring an inertial navigation system (INS) that guides the missile to preset coordinates and an active radar seeker that then guides it to a target.

When you select the Harpoon by pressing the Backspace key, the FSX's radar will automatically change to SEA mode (see Figure 10.2).

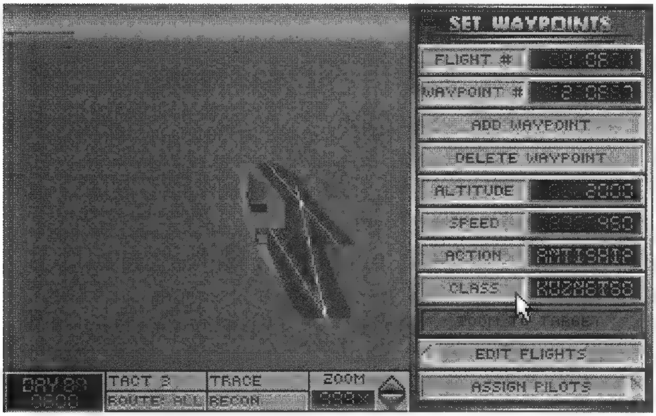
The REO will show SEA in sea-scanning mode, and the range the radar is currently set for—10, 20, 40, or 80 nm. To change the range, press **F8** or **Shift+F8** (**Shift+F8** cycles through the ranges in the opposite order from **F8**).

WARNING

At low levels, the curvature of the earth will reduce the range the SEA radar can show you. At 80 nm from your target, you need to be at least 1900 feet up; at 40 miles, 950 feet; at 20 miles, 475 feet; at 10 miles, 273 feet. (At 0 miles, try to avoid flying into your target....)

NOTE

You use the Antiship waypoint action code to order a flight to attack ships. Once you select Antiship, the Target button will change to read Class, and you can choose from the different ships in the Russian fleet.



ALTITUDE 2000

ACTION ANTISHIP

CLASS KUZNETSO

To assign a specific target to a Harpoon, view the enemy fleet on the Waypoints screen and designate your victim as the target for the waypoint.

To designate a target, press **T** to cycle through the targets shown on the REO. Once you've designated a target, you can press F1 to zoom the REO display of the SEA radar by four

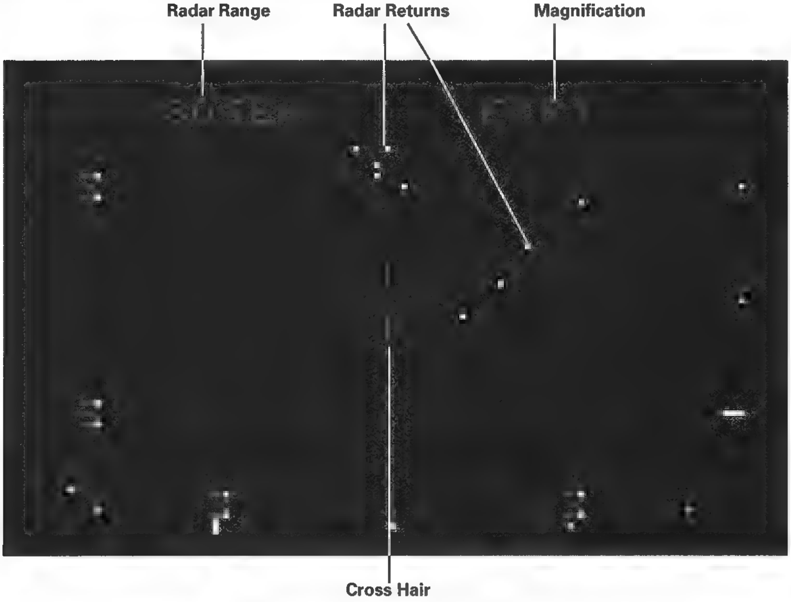


FIGURE 10.2 *Using the sea-scanning mode of the FSX's radar for controlling Harpoon missiles*

times. You can then press **T** to move between those targets in the magnified area. Press **F2** to zoom the REO display back out.

WARNING

Note that ECM, chaff, and the CADS-1 Russian missile defense system can stop your Harpoons.

SHIPS IN OPERATION: FIGHTING TIGER

You'll also see a number of different sizes of ship in Operation: Fighting Tiger, including the following in the red corner (Russia):

The **Admiral Kutznetsov aircraft carrier**, a floating battlefield that carries three squadrons of modified MiG-29s and Su-27s. The Kutznetsov is armed with medium-range and short-range SAMs that can take out not only attacking aircraft but also anti-ship missiles, and its Sky Watch radar system can detect aircraft up to 300 nm away.

Kirov-class battlecruisers are huge nuclear-powered warships that carry tremendous quantities of anti-ship, anti-submarine, and anti-aircraft weaponry. You'll be most interested in avoiding the SA-6 Grumble missiles, which can speed you to Valhalla from up to 54 nm, but you'll also need to watch out for a Kirov's SA-9s, its SA-8s, and of course its 130-mm gun. Kirovs also carry helicopters.

Udayov-class destroyers are some of the destroyers you'll find screening the Kutznetsov and the Kirovs. They pack a bunch of short-range SAMs and AAA, including SA-9s and SA-8s, not to mention a couple of helicopters each. (We'll look at the new missiles in a moment.)

Ivan Rogov–class amphibious warfare ships each carry a naval infantry battalion complete with its equipment. The Rogovs are relatively poorly protected with some short-range SAMs and AAA, and are comparatively easy to attack provided they're not protected by Kirovs or Udayovs—which they often are. Rogovs launch two Lebed landing craft apiece.

Berezina-class replenishment oilers make important targets, because each can carry 16,000 tons of fuel, 500 tons of fresh water, and 3000 tons of munitions and provisions—enough to keep a number of the enemy supplied for quite a while. Watch out for the ASW helicopters and rocket launchers the oilers carry.

Lebed-class air-cushion landing craft make very attractive targets, because they're armed with only a 30-mm Gatling gun. On the other hand, they're capable of 70 knots, which means they're not entirely sitting ducks. Your best bet against a Lebed is a Maverick or two. Each Lebed can carry two tanks. Before you ask, an air-cushion landing craft is basically a hovercraft (in the same way that an earth-inverting horticultural implement is a spade).

And in the blue corner (Japan):

Allen M. Sumner–class destroyers are destroyers Japan bought from the U.S. Navy after World War II. Each carries one helicopter, Stinger SAMs, and AAA—but you shouldn't be attacking them in the first place....

NEW WEAPONS IN OPERATION: FIGHTING TIGER

Here's a brief look at the new weapons you'll see in Operation: Fighting Tiger. First, the weapons you get to use (in the Kurile Islands theater):

The **AGM-84A Harpoon** is an anti-ship missile that you'll launch from the FSX. See the section *Attacking Ships with the Harpoon* (later in this chapter) for details on using it.

The **AIM-9R Sidewinder** is an all-aspect imaging infrared air-to-air missile, an update to the AIM-9M.

The **AIM-120E AMRAAM** is a radar-guided missile with a range of 25 nm, an upgraded version of the AIM-120 that you met in Falcon 3.0.

And next, the Russian missiles you'll find yourself dodging:

The **AA-9 Amos** is a dangerous sucker, a standoff interception missile carried by the MiG-31. The missile has a range of 45–85 nm and is guided by a signal that the MiG-31 bounces off its target.

The **AA-10 Alamo** is a medium-range air-to-air missile that appears in both radar-guided and infrared versions.

The **AA-11 Archer** is an air-to-air dogfighting missile comparable to the AIM-9M.

The **SA-9** is a short-range, laser-guided surface-to-air SAM.

The **SA-6 Grumble** is a vicious surface-to-air SAM that can reach out 54 nm at the tremendous speed of Mach 6.

The **SA-8 Gremlin** is a short-range surface-to-air infrared missile.

The **SA-4 Gecko** is a short-range surface-to-air radar-guided missile.

The **SA-2 Guideline** is a medium- to long-range SAM with a two-stage guidance system that means you really need to watch out for it. An operator controls the first two-thirds of its flight, after which the radar guidance kicks in. This means that a Guideline can get painfully close to you before your TWI is able to pick it up.

NEW MISSIONS IN OPERATION: FIGHTING TIGER

Operation: Fighting Tiger adds several new types of mission to those you'll have met already in Falcon 3.0. Some of them only apply to the Kurile Islands theater.

You'll find yourself flying tactical air support of maritime operations (TASMO), high-asset–value combat air patrol (HAVCAP), and suppression of enemy air defenses (SEAD). The next three sections discuss these three new missions.

TACTICAL AIR SUPPORT OF MARITIME OPERATIONS (TASMO)

Tactical air support of maritime operations involves both amphibious operations and straightforward maritime attack (take a look at the sidebar for suggestions on the best way to attack the Russian fleet).

When defending against amphibious operations, your key priority will be to obliterate enemy units already on shore to prevent them from establishing a beachhead secure enough to permit large-scale landings from the Rogovs. Attack the troops holding the beachhead before turning your attention to landing craft or ships. Bear in mind that any beachhead will have air support, and that you'll need to defend your ground-attack aircraft against it.

ATTACKING THE RUSSIAN FLEET

Sooner or later, you'll find yourself ordered to attack the Russian fleet. Here's a rough plan of action—adapt it to suit your circumstances:

- You'll usually find flights of Su-27 fighters flying a barrier combat action patrol (CAP) around a hundred nm from the Kutznetsov. Take along air-to-air missiles to deal with these guys, consider adding an escort flight to protect your maritime-attack flight.
- Try to plot a route that will avoid the destroyers screening the fleet from submarines. This may involve some finicky work with waypoints, but the extra care will be well worth it.
- Be prepared to have Grumbles fired at you before you're able to lock on your Harpoons. Take along an ECM pod and a full load of chaff and use both to confuse the Grumbles.
- Use the Harpoon as your primary anti-ship weapon. If you run out of Harpoons, try the GBU-15 instead.

HIGH-ASSET-VALUE COMBAT AIR PATROL (HAVCAP)

You may be assigned to fly HAVCAP missions to protect the E-3 AWACS, which is crucial to the allied war effort. HAVCAP is similar to other combat air patrols, but your overriding goal is to protect the AWACS. For HAVCAP, set either ESCORT waypoints (to have your wingmen attack enemy aircraft within 10 nm) or CAP waypoints for a wider screen (20 nm).

SUPPRESSION OF ENEMY AIR DEFENSES (SEAD)

A suppression of enemy air defenses mission is similar to close air support, but on a SEAD mission, your goal is to destroy the anti-aircraft weapons and radar systems at the target rather than any old ground forces. Success is defined as destroying one maritime SAM or one-third of the SAMs at a land target.

WARNING

Watch out for SAM crews keeping their radar off until you've passed by and then shooting at the rear of your aircraft. Use your wingmen to flush out SAM sites with their radar turned off, and then blast them with HARMs or Shrikes when they turn the radar on. Carry a full load of air-to-ground weapons for SEAD missions and assign an escort flight or two.

NEW SUNDRIES IN OPERATION: FIGHTING TIGER

In addition to new aircraft, new ships, new weapons, and new missions, Operation: Fighting Tiger also boasts some new or improved features that we'll look at in this section.

NEW MESSAGES IN OPERATION: FIGHTING TIGER

Here are some of the more important new messages you'll hear in Operation: Fighting Tiger:

- *From AWACS: Be advised—enemy ECM activity detected* tells you that the enemy are using their electronics countermeasures transmitters and may be able to prevent you from achieving radar or missile lock.
- *Copy—returning to base* is how your wingmen will acknowledge your command to return to base.
- *Copy—closing it up* and *Copy—kicking out* indicate that your wingmen are obeying your Close Up Formation and Spread Formation commands, respectively. (See the sidebar on *New*

Wingman Maneuvers in Operation: Fighting Tiger for details of these new maneuvers.)

- *Closing on ship target* tells you that one of your wingmen is targeting a ship.
- *Dumping air-to-ground stores* warns you that one of your wingmen is jettisoning his air-to-ground stores to lighten his aircraft. He'll usually do this either when he needs to reduce drag and improve his maneuverability after being attacked by an enemy fighter or if he's in fuel trouble.
- *Harpoon away!* indicates that a wingman has fired a Harpoon missile.

There are also a bunch of new radio messages that you'll hear only in the Kurile Islands theater, where special rules of engagement apply:

- *From AWACS: You are violating rules of engagement* warns you that you're violating the rules of engagement by attacking enemy forces. Desist.
- *From AWACS: Be advised—increased enemy air activity* tells you that large numbers of enemy aircraft are being launched, possibly in your direction. Keep your eyes and electronics peeled.
- *From AWACS: Permission given to destroy enemy aircraft* tells you it's OK to attack enemy aircraft (not enemy forces).
- *You're on your own...* tells you that one of your wingmen is leaving your flight without your authorization.
- *One Russian bugging out!* tells you that one of your wingmen has routed a Russian.

You may not notice it at once, but in Operation: Fighting Tiger the radio messages have been improved—there are some new ones, and some of the old ones sound better.

Operation: Fighting Tiger replaces the Intelligence option in the Difficulty Levels screen with a Campaign option that lets you set how difficult your campaigns will be—ESY for Easy, STD for Standard, and HRD for Hard. This Campaign setting helps determine the Realism Value shown in the upper-left corner of the Difficulty Levels screen.

Among the less pleasant features that Operation: Fighting Tiger adds to Falcon 3.0 is a thick overcast weather pattern that'll clog up your vision big time. Plan your missions carefully so that you'll know what to do when the weather turns foul.

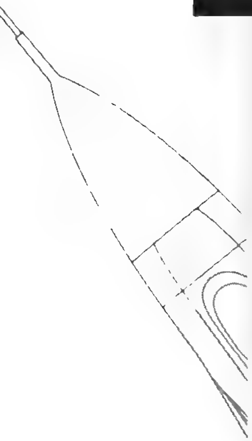
NEW WINGMAN MANEUVERS IN OPERATION: FIGHTING TIGER

Operation: Fighting Tiger brings you three new wingman maneuvers so simple and useful that you'll wonder why you didn't have them before:

- Press Shift+F to issue a Spread Formation command. This will cause all your wingmen (not just the immediate wingman) to double their distance from one another. Your wingmen will respond with *Copy—Kicking out!* You can order a Spread Formation several times provided your wingmen maintain visual contact.
- Press Shift+G to issue a Close Up Formation command. You've guessed it—this causes all your wingmen to halve their distance from one another. Your wingmen will respond with *Copy—Closing it up!* Again, you can order several Close Up Formations, but your wingmen are smart (and smartassed) enough to refuse if obeying would mean flying into each other.
- Press Shift+H to issue a Return to Base command. This tells your wingmen to return to base as directly as possible. Your wingmen will respond with *Copy—returning to base*, unless they're unable to do so for some reason. Note that once you issue a Return to Base command, your wingmen will no longer respond to your orders.

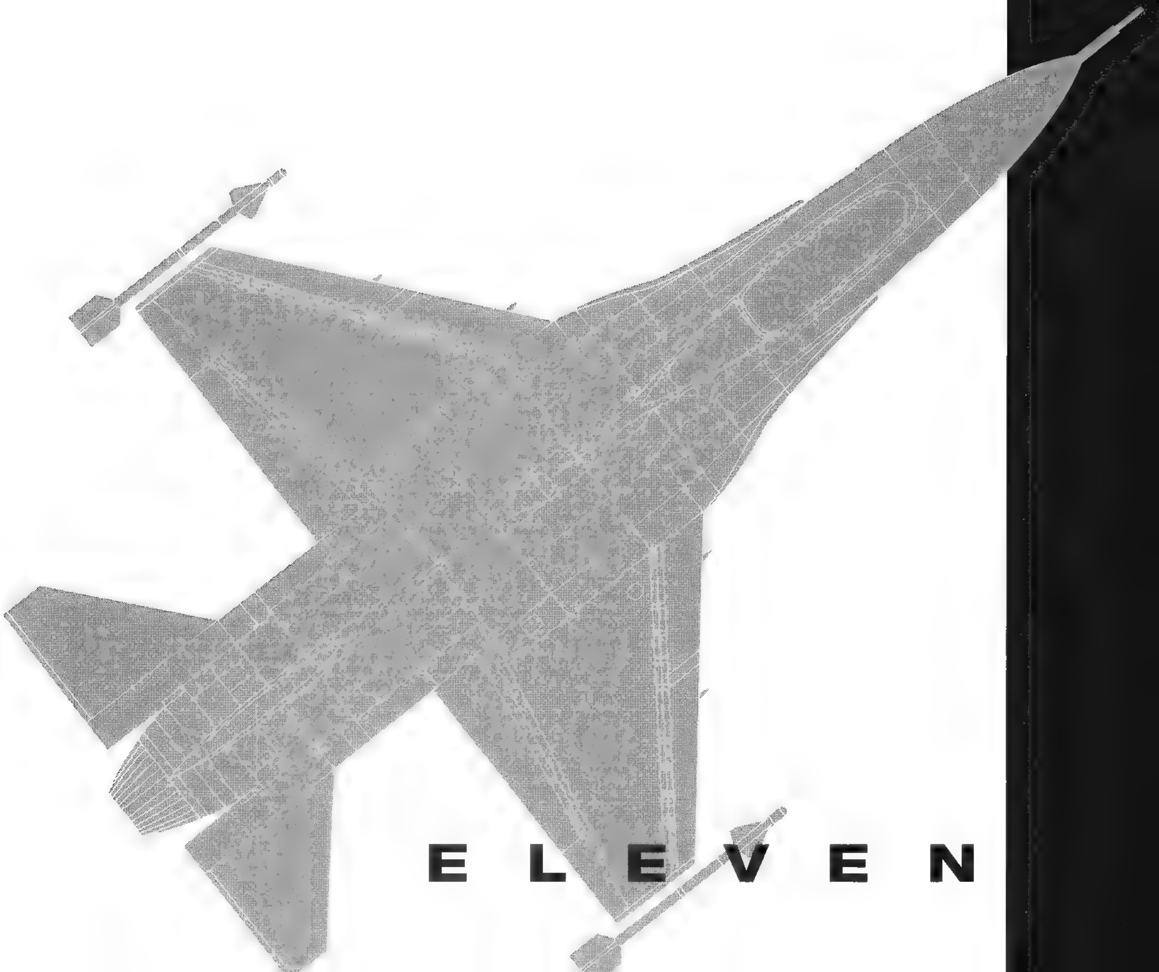
Once you've got the hang of the new weapons, missions, and theaters in Operation: Fighting Tiger, you're ready to graduate from the F-16 and FSX to different aircraft. Falcon 3.0's two add-on packages, MiG-29 and Hornet, will test your skill and broaden your flying experience. Turn to the next part when you're ready....

PART FOUR

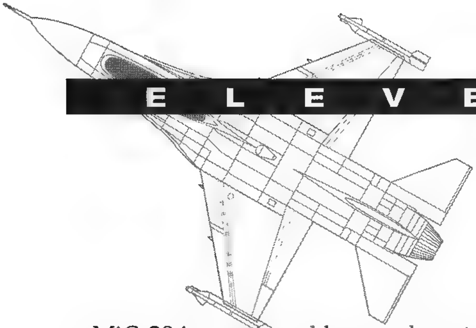


MIG-29, HORNET, AND ADVANCED FLYING TACTICS

MiG-29



ELEVEN



ELEVEN

MiG-29 is a major add-on package to Falcon 3.0 that lets you pit your wits against human opponents in your campaigns. In MiG-29 you get to fight against the F-16s you by now know well.

You'll be relieved to know that in MiG-29, most of the features work in the same way as those in Falcon 3.0, and you'll be able to configure your setup, indulge in Instant Action (facing Coalition forces, of course), and train in Red Flag as you learned to do earlier in this book. (ACMI, which we'll look at in Appendix C, also works the same for MiG-29 as for Falcon 3.0.)

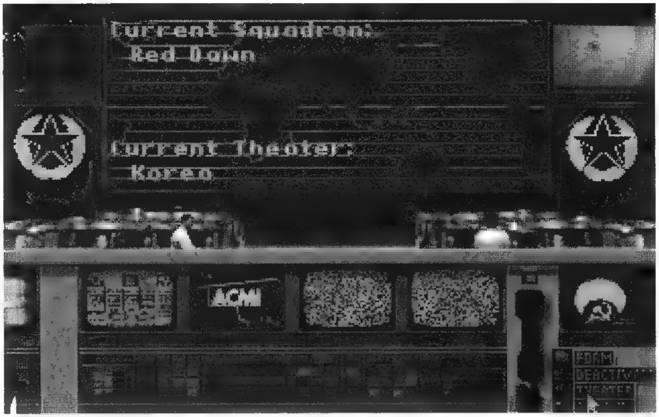
NOTE

You can also get a stand-alone version of MiG-29 if you want to install and run it without Falcon 3.0. You can install Hornet to the stand-alone version of MiG-29.

STARTING MIG-29

To start MiG-29, switch to the Falcon 3.0 directory into which you installed MiG-29, and type **MiG29**↵ at the DOS prompt.

After the MiG-29 opening screen, a blazing opening battle sequence (press **Esc** when you tire of it), and the credits (again, press **Esc** to bypass them), you'll see the War Room for MiG-29, shown here. Form your squadrons here and assign them to theaters as you did for Falcon 3.0.



Current Squadron:
Red Dawn

Current Theater:
Korea

THE MIG-29 HUD AND COCKPIT

NOTE

For instructions on installing MiG-29, see Appendix A.

Most of the controls for the MiG-29 work in the same way as those for the F-16, with the following notable exceptions:

Item	Key	Effect
Bombing airspeed	D	The MiG-29's bombing pipper is preset for bombing at 2000 feet and a -30° angle of attack. Press **D** to drop the airspeed in 50-knot decrements between 550 and 300 knots (from 300, **D** will take the speed back to 550 knots).
Flaps	F	The MiG-29 has automatic flaps—you don't need to work them at all, but you can lock out the automated flap system by pressing **F**.
Cannon	K	Press **K** to toggle the automatic cannon on and off. When the automatic cannon is on, it will fire at any target in the bullet path.
Drogue chute	O *and* Shift+O	Press **O** to open the drogue chute for landing on a short runway; press **Shift+O** to disconnect the drogue chute.
Trim tabs	↑, ↓, →, and ← on numeric keypad	Use the arrow keys on the numeric keypad to adjust the trim of the plane so that it'll fly straight and level at different speeds. If you're flying with the keyboard, hold down **Ctrl** when you press the arrow keys.

Item	Key	Effect
HUD airspeed	Ctrl+A	Toggles the airspeed scale between true airspeed (the default) and indicated airspeed.
SCN radar	F5	SCN radar is similar to the F-16's NAM mode.
IRST radar	F6	IRST radar is similar to the F-16's STT mode; IRST can track F-117As and helicopters by heat at a range of up to ten miles.
Helmet tracking device ("monocle")	F7	The helmet tracking device locks the targeting system to the pilot's helmet (only in Padlock view).

As for the F-16 and FSX, you'll do better flying the MiG-29 with a joystick than with the keyboard. Unlike the F-16, which is a fly-by-wire machine trimmed by a computer, the MiG-29 requires trimming to keep it flying straight and level at different speeds. Basically, each time you adjust the speed and want to keep flying straight and level without holding the stick off-center to correct the trim, you'll need to trim the aircraft using the arrow keys (↑, ↓, →, and ←). When the MiG-29 is going faster than its trim speed, it'll tend to nose up; press ↑ to apply forward trim. When it's going slower than its trim speed, the nose will tend to drop; press ↓ to apply backward trim. You may need to apply left and right trim (← and →, respectively) if your plane is hit or if you have weapons unevenly loaded.

The upside of the MiG-29 being a non–fly-by-wire aircraft is that there's no computer to stop you heaving it about the sky in drastic maneuvers to avoid death and wreak mayhem. You'll also find it much easier to give yourself redout and blackout in the MiG-29 than in the F-16.

NOTE

You'll only need to trim the aircraft in the Realistic flight model—in the other flight models, trimming is automatic.

UNDERSTANDING THE MIG-29 COCKPIT

OK, let's take a look at what you'll find around you in the MiG-29 cockpit once you've started the simulation (see Figure 11.1). Since we've already been through the main items for the F-16, I'll keep the description of similar items on the MiG-29 to a minimum—but still, there's a bunch of stuff you've got to know.

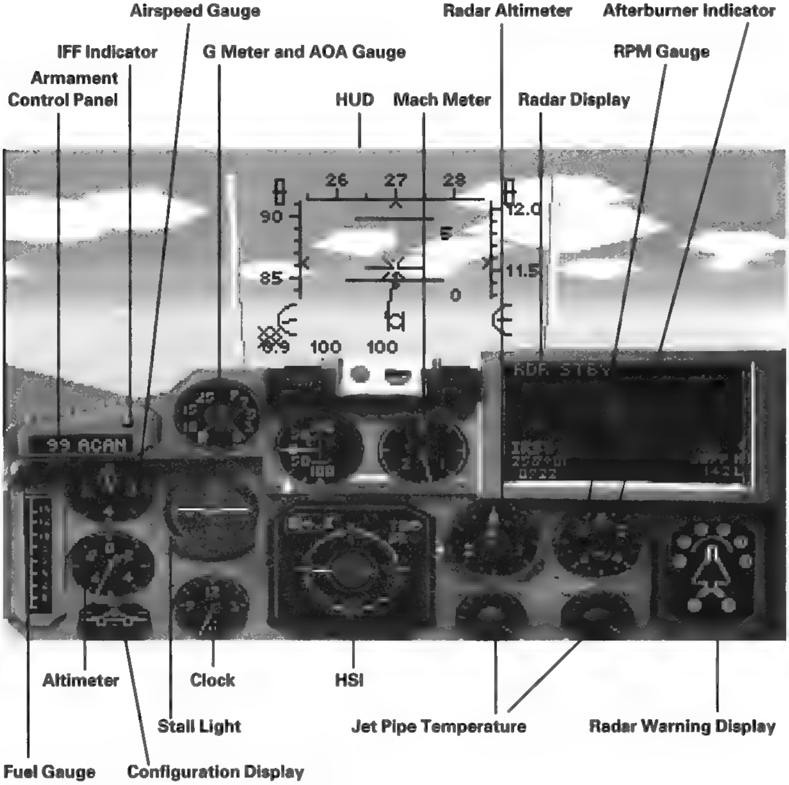


FIGURE 11.1 *The MiG-29 cockpit*

READING THE MIG-29 HUD

As you'll see the moment you look at it, the designers of the MiG-29 HUD (see Figure 11.2) were firm believers in miniaturization—there's a whole bunch of information all jammed in there together, and most of it looks pretty weird. The F-16's HUD seems straightforward and friendly by comparison. But don't worry—you'll get the hang of the MiG-29's HUD in just a few hours' flying. Take each indicator in turn and watch how it behaves as you fly the plane.

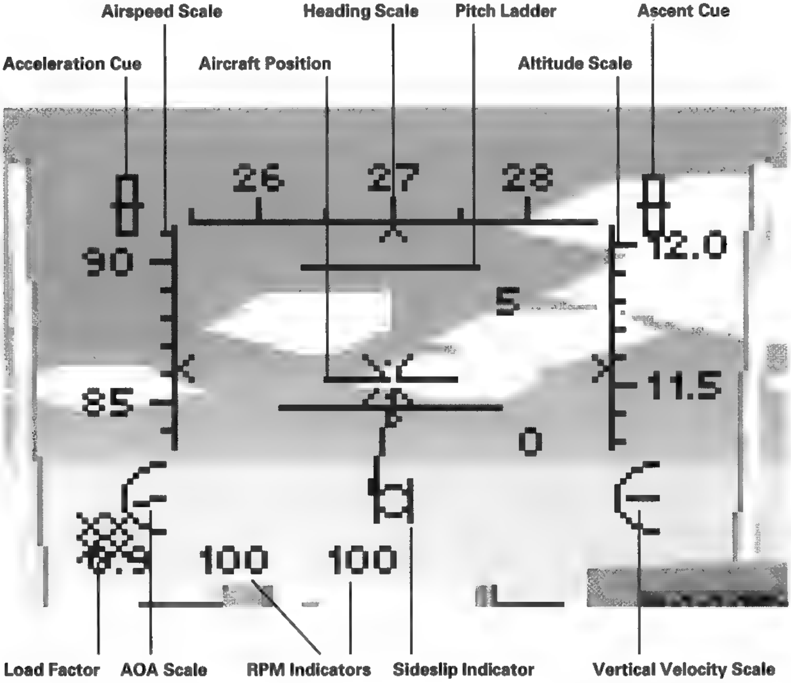


FIGURE 11.2 *The MiG-29 HUD*

Heading scale	The sliding scale at the top of the HUD marked in ten-degree segments; the center mark shows your heading.
Waypoint heading	The box of the heading scale shows the direction to the waypoint. Turn toward the waypoint to bring the box into the center of the heading scale.
Acceleration cue	The vertical bar scale (a door-shaped box with a line across it) in the top-left corner of the HUD shows whether the plane is climbing (the line will appear above the center of the box) or descending (below the center). When your speed is steady, the line will cross the center of the box.
Ascent cue	The vertical bar scale in the top-right corner of the HUD shows whether the plane is rising (the line will appear above the center of the box) or falling (below the center) relative to its velocity vector.
Airspeed scale	The scale on the left side of the HUD shows true airspeed in ten-knot increments. You can switch to indicated airspeed by pressing **Ctrl+A**.
Altitude Scale	The sliding scale on the right of the HUD shows altitude *above sea level* in thousands of feet.
Pitch Ladder	Straight lines indicate climbing angles; chevrons (upward-pointing angled lines) indicate diving angles. The lines are 5° apart.
Aircraft Position	The fixed horizontal lines in the middle of the HUD show the position of your plane relative to the horizon lines of the pitch ladder.

TIP

The MiG-29 is most maneuverable at 300–500 knots indicated airspeed.

AOA Scale	The needle on the semicircular scale on the lower left of the HUD moves up or down to indicate the plane's angle of attack.
Vertical Velocity Scale	The needle on the semicircular scale on the lower right of the HUD moves up or down to indicate the plane's rate of climb or descent.
Sideslip Indicator	The circle and two bars works like a spirit level in reverse: The circle moves to the side to which the plane is sideslipping.
Load Factor	The readout in the bottom-left corner of the HUD shows how many Gs the plane is pulling.
RPM Indicators	The readouts in the bottom center of the HUD indicate the current percentage of maximum RPM.
Altitude (AGL) Indicator	The readout to the right of the RPM indicators shows your plane's altitude *above ground level*. Unlike in the F-16, this only kicks in when you're below 5000 feet.

As in the F-16, press ↵ to switch among the air-to-air HUD modes. Here are the indicators you'll see:

- **Gun pipper**: a star followed by a tiny diamond. Try to get the target within the pipper's marks at less than 1500 feet. The diamond shows where the bullet will arrive at 2000 feet.
- **Missile reticle**: a circle in the center of the HUD. Fire when you see >>*LOCK*<< flash across the center of the reticle.
- **Target direction indicator**: When the target is outside the HUD, the target locator line will point from the center of the HUD toward the target. Follow the line to find the target.

- **Strafing pipper**: a star pipper similar to the gun pipper for air-to-air combat.
- **Rocket pipper**: a star pipper in the center of the HUD for aiming unguided rockets.
- **Bomb pipper**: an ellipse with a dot in the center. The pipper initially indicates the striking point of a bomb released at 2000 feet at a speed of 400 knots and in a 30° dive. Press **D** to drop the speed in 50-knot increments; the pipper will move accordingly.
- **Missile crosshair**: a large cross in the center of the HUD for aiming the Kh-23 air-to-ground missile.

USING THE MIG-29'S RADAR

Like the F-16, the MiG-29 offers several radar models that you set in the Difficulty Levels screen:

- SAD (situational awareness display) shows all enemies at all times. You can switch from SAD to IRST dogfighting mode by pressing **F6** and back by pressing **F5**.
- SWT (scan-while-track) indicates targets in front of your aircraft. You can switch from SWT to IRST dogfighting mode by pressing **F6** and back by pressing **F5**.
- HFR (high-fidelity radar) offers four modes: SCN (scan), TRK (track), SWT (scan-while-track), and IRST dogfighting mode. (Appendix C discusses HFR mode for the F-16, the MiG-29, and the Hornet.)

Figure 11.3 illustrates the MiG-29's radar.

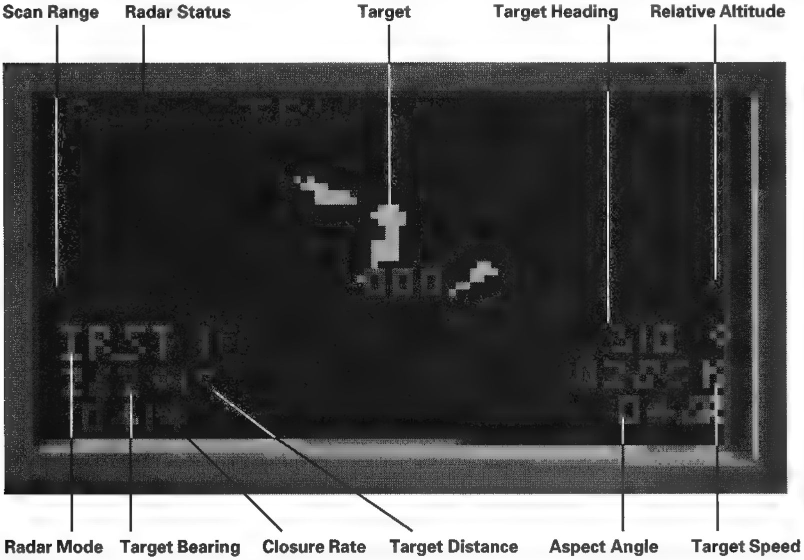


FIGURE 11.3 *The MiG-29's radar*

The MiG-29's radar shows the following:

Radar status	RDR STBY indicates that the radar is not emitting (so that the target won't spot your plane); RDR OFF means you've turned the radar off (by pressing **R**; press **R** again to turn it back on); RDR ON tells you that the radar is on and emitting.
Target	The white square shows the location of the target in relation to your aircraft.
Relative altitude	The readout below the red square shows the altitude of the target compared to that of your plane.

Radar mode and scan range	The uppermost line in the bottom-left corner of the radar display shows the radar mode (e.g., IRST) and the range the radar is currently scanning (e.g., 10 miles).
Target bearing and distance	The second line shows the bearing of the target from your plane and the distance in miles. (When you're closer than a mile, the readout switches to tenths of miles.)
Closure rate	The lowermost line shows how fast you are approaching the target. (A negative reading shows the target is drawing away from you.)
Target heading	The uppermost figure on the right side of the radar display shows the direction the target is heading.
Target speed	The second figure shows the speed (in knots) the target is doing.
Aspect angle	The lowermost figure shows your angle in degrees from the target's heading.

READING THE MIG-29'S INSTRUMENTS

Here's what the cockpit instruments are trying to tell you:

The **Armament Control Panel** shows which weapon you've got selected. There are three cannon modes for the GSh-301 cannon: CAN for air-to-air mode (ACAN for automatic) and STRF for air-to-ground mode. There are four missile modes: R60 for the R-60 rear-aspect infrared missile; R73 for the R-73 all-aspect infrared missile; R23R for the R-23R radar-guided missile; and KH23 for the Kh-23 air-to-surface missile.

UB57 represents the UB-16-57 or UB-32-57 rocket pod. Finally, there are four bomb modes: F250 for the FAB-250 bomb and FBHD for its high-drag version; F500 for the FAB-500 bomb; and RBK5 for the RBK-500 cluster bomb.

The **IFF Indicator** lets you identify an unknown aircraft as friend or foe by pressing **N**. If the light comes on, the aircraft is a friend.

The **G Meter and AOA Gauge** are on the right and left sides of the dial, respectively. The G Meter shows current G forces (the long needle) and highest G forces (the short needle) for this flight. The AOA gauge shows the angle of attack in degrees.

The **Fuel Gauge** shows the total fuel remaining (measured in thousands of pounds).

The **Airspeed Indicator** shows the plane's current speed in hundreds of knots.

The **Altimeter** shows altitude *above sea level* in thousands of feet.

The **Attitude Reference System** shows how the plane is angled compared to the horizon. The red and blue segments indicate the artificial horizon. Use the attitude reference system when visibility is poor.

The **Stall Light** warns you that a stall is imminent. You're likely to stall if you persist in maintaining an AOA of 40° or more. The MiG-29 recovers well from stalls *provided you've got enough height.* Practice stalling until you're able to recover consistently.

The **Configuration Display** shows the positions of the landing gear and flaps.

The **Clock** shows mission time.

The **Master Caution Lights** just below the HUD will flash when your plane has sustained damage. To stop them from flashing, use right view (press **6**) to check your master caution panel.

The **Turn and Slip** indicator uses the yellow needle to show the rate of turn to the right or left (in tens of degrees per minute) and the red needle to show how many minutes a 360° turn will take.

The **Mach Meter** measures the current speed in Mach.

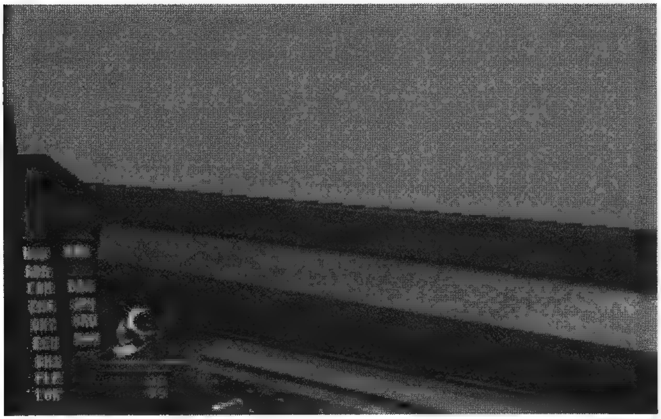
The **Horizontal Situation Indicator and Navigation Display (HSI)** shows you waypoint information. The TO and FR lights in the top-right corner of the HSI show whether you're heading toward or away from a waypoint. The white needle indicates your heading, and the red mark on the circle of the HSI indicates the direction to the waypoint. The short yellow lines inside the circle show your selected radial; the white tip on one of the yellow lines shows which way you should go. Line the waypoint bearing marker with the white heading needle to reach your waypoint. The red line in the center of the HSI shows you how far you are off the correct approach path to the waypoint by sliding left and right in five-degree increments.

The **Radar Altimeter** below the radar display shows altitude in thousands of feet above ground level. This only works for altitudes of less than 3000 feet, and is for low-level flying.

The **RPM Gauge** shows how much thrust you're currently applying to the engines. The afterburners will kick in at 90%.

The **Jet Pipe Temperature** gauges show jet pipe temperature in Centigrade, usually between 450° and 750°. Watch out for high readings, which can mean your engine's on fire.

The **Radar Warning Display** in the lower-right corner of the instrument panel shows eight warning lights around the silhouette of an aircraft to indicate threats. A flickering amber light indicates a radar has swept over the aircraft; a red light indicates a radar lock; and a flashing white light indicates that a missile has been launched at you.



In the MiG-29, the Chaff/Flare Indicators and ECM Indicator appear in Right view rather than on the HUD.

In Right view, you also see the Master Caution Panel, which indicates what damage your aircraft has sustained.

MIG-29 TRAINING

MiG-29 comes complete with training missions to bring you up to scratch with this powerful aircraft and its fearsome weapons. Each mission is set up for one weapon, though you can change the missions and your armaments for increased realism once you've mastered the basics.

These missions are designed for use with High-Fidelity Radar mode and Intermediate Level (choose these in the Difficulty Levels screen).

Here are brief details on the missions:

TIP

In the MiG-29, as in the F-16, you can eject by pressing Ctrl+E three times in rapid succession.

WARNING

Your FALCON3 directory can hold only 64 missions. If you don't see all of the MiG-29 missions, you may need to remove some less wanted mission files from the FALCON3 directory. Mission files have the extension .RFM.

MIG29GUN gives you a guns-only attack on some C-130 transports. These make easy targets, so you can concentrate on learning to fly the MiG-29. Consider using the automatic cannon mode (press **K**) at first, and then trying manual attacks once you've got the hang of flying the plane.

WARNING

The cannon carries only 150 rounds, so don't squander ammunition. If the automatic cannon seems to be firing too much, press K again to switch it off.

MIG29BVR sets you up for a beyond-visual-range kill against a captured F-5 using the two R-27R all-aspect radar-homing missiles.

MIG29R73 teaches you how to ambush enemy pilots by using the IRST radar to approach undetected. In this mission, you should approach the two F-4s low and from behind using the infrared tracking system to detect them without them detecting you, and then launch two of the R-73 short-range infrared missiles at them.

MIG29R60 teaches you how to use missiles as distractions when attacking the enemy. In this mission, you'll approach a B-52 bomber escorted by two F-16s. By firing a missile at each of the F-16s, you can cause them to break off, giving you a chance to attack the B-52 and make a speedy getaway.

MIG29BMB is a straightforward practice bombing mission designed to give you the hang of bombing a row of targets. The mission is set up with FAB-500s, but on subsequent runs you can change to the other kinds of bomb for practice.

MIG29K23 teaches you to use the Kh-23 guided air-to-surface missile for attacking moderate-sized hard targets—in this case, an armored column.

MIG29STF gives you two strafing runs, the first at a column of trucks that won't offer much resistance, the second at a well-defended enemy encampment. In the latter, you'll have to deal with an F-4 Phantom patrol and a SAM battery.

BEEFING UP THE TRAINING MISSIONS

Don't be disheartened if it takes you a while to master all the weapons on the MiG-29—after all, you're learning to fly a whole new aircraft, and that takes time for any pilot. Flying different fighters, with their complicated systems and delicate responses, is many times harder than driving different cars.

But once you've mastered the controls and weapons, and successfully completed the missions outlined above, you'll have reached an intermediate stage of ability on the MiG-29. To improve your ability, you'll need to create more challenging missions.

The quickest way to do this is to enhance the missions MiG-29 provides by changing them in the following ways:

- Increase the difficulty level by selecting Advanced in the Difficulty Levels screen.
- Add wingmen to your mission and practice flying with them.
- Add more enemy defenses to your targets by using the Coalition Forces screen. Increase the number of SAMs and AAA until attacking becomes all-nigh impossible.

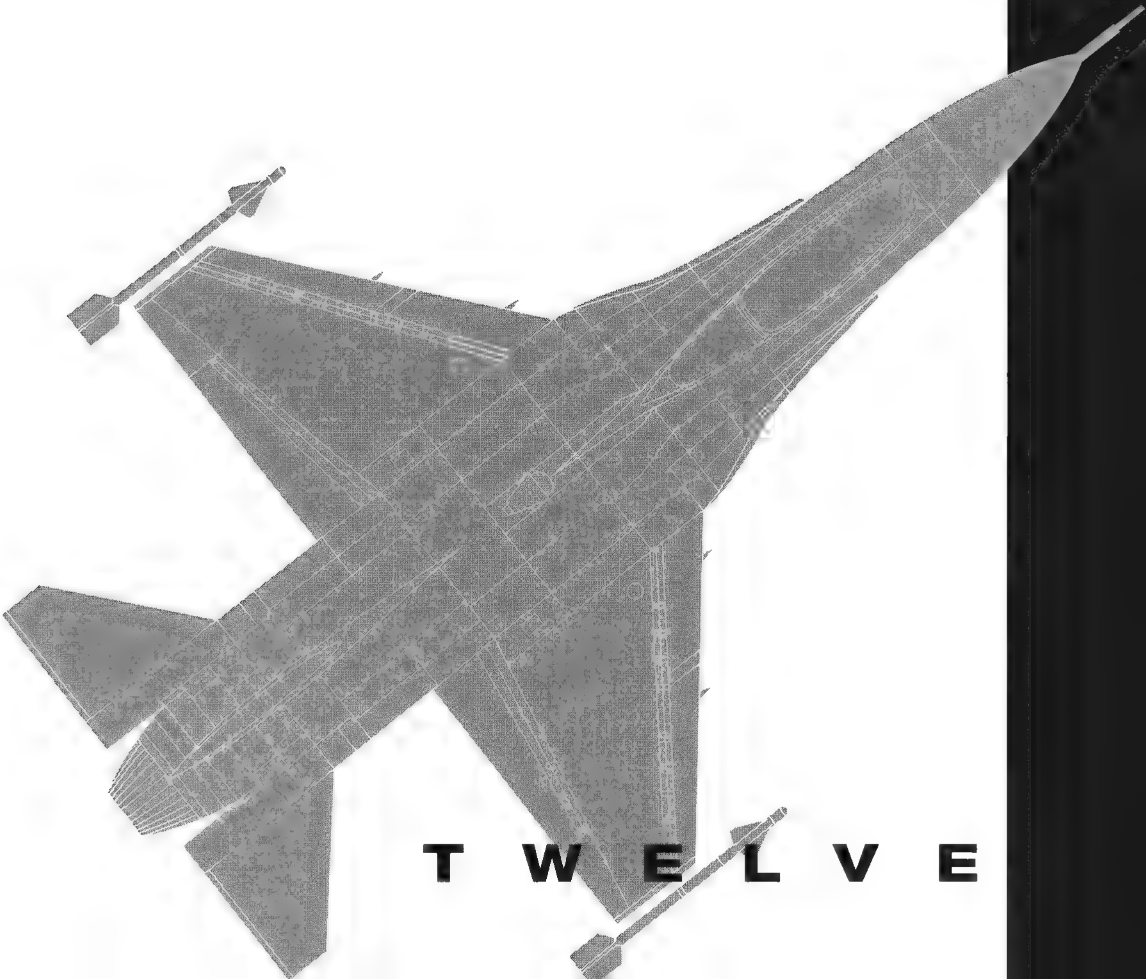
- Add enemy aircraft to the missions by using the Coalition Aircraft screen. Alternatively, upgrade the F-4 Phantoms that feature in some of the missions to F-16s to make the combat more challenging.
- Change the waypoints for enemy aircraft so that they act more aggressively by using the Coalition Waypoints screen. Set CAP or INTERCEPT actions to have the enemy actively engage you.
- Upgrade the weapons the enemy aircraft carry for their missions to make life more difficult for you.

WINGMAN MESSAGES IN MIG-29

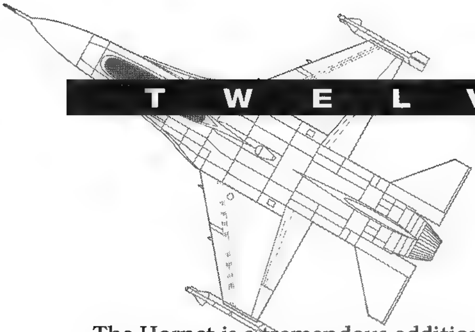
You'll see a bunch of new wingman messages in MiG-29, most of them dealing with the downing of enemy pilots. These range from the merely victorious (*Go back to computer games, Comrade!*, *Is that my boot print on your butt?*, *Bye bye, Miss American Pie!*) through the vicious (*Squeal, you capitalist pig!*, *One more dead playboy!*, *Eat borscht!*) to the bizarre (*You are pilot, not murderer, da!?*, *Do svidanija, Babushka!*, *Have you closed your flight plan?*).

As in Falcon 3.0, you can shut your wingmen up by pressing Shift+R (at least, until you issue another wingman command).

HORNET



T W E L V E



TWELVE

The Hornet is a tremendous addition to the Falcon 3.0 series of air-combat-simulation programs—a carrier-based ground-attack aircraft with fantastic maneuverability and striking power.

Hornet also adds a new theater to your copy of Falcon 3.0 or MiG-29—Bosnia-Herzegovina. If you like your thrills up to the minute, this theater is the place to be.

TIP

Installing Hornet is dead simple once you've got Falcon 3.0 or MiG-29 installed on your computer. See Appendix A for details.

STARTING HORNET

You'll have guessed this already. To start Hornet, switch to your FALCON3 directory and type **HORNET**↵. You'll see an opening animation sequence, and then you'll find yourself in the Hornet War Room.

THE HORNET DISPLAYS AND COCKPIT

As soon as you start flying the Hornet, you'll see that many of the instruments, controls, and weapons are similar to those in the F-16 and MiG-29. Since space is limited, in this chapter I'll concentrate on the items that are different.

The view controls in the Hornet work the same as do those in the F-16 and MiG-29, though the views in the Hornet are arranged differently than in those planes, as we'll see in the coming sections.

UNDERSTANDING COCKPIT LOOK-UP VIEW

The default view in Hornet is of the upper part of the cockpit—the head-up display (HUD) and two digital display indicators (DDIs), as shown in Figure 12.1. This *cockpit look-up view* resembles Forward view in the F-16 and MiG-29.

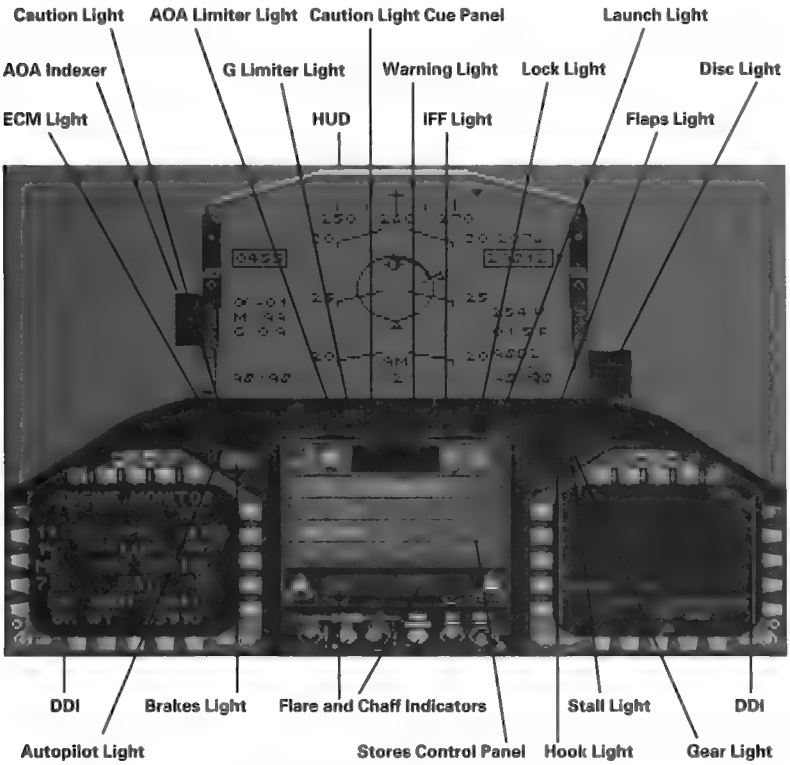


FIGURE 12.1 *The standard Hornet view—Cockpit look-up view*

Here's what you're seeing in cockpit look-up view. Many of the items are similar to those you've learned to use in the F-16 and MiG-29; others, such as the DDIs (discussed ahead), are new.

Stores Control Panel Shows the weapon you have selected.

Launch Light Warns you that an enemy has launched a radar missile at you.

Lock Light Warns you that an enemy radar has locked onto you.

Warning Light Flashes when you receive a warning message from the Voice Message System.

Caution Light Flashes when you receive a caution message.

Flare and Chaff Indicators Show your remaining flares and chaff.

Stall Light Warns you that you've stalled.

Autopilot Light Indicates the autopilot is engaged.

Brakes Light Indicates that the speed brakes are engaged.

Disc Light Tells you that the nosewheel steering system has disconnected from the ground during takeoff.

Gear Light Indicates that the landing gear is lowered.

Hook Light Indicates that you have lowered the tailhook to prepare for landing on an aircraft carrier.

Caution Light Cue Panel Warns you that you've damaged your aircraft. These lights correspond to the light panel in Right view for quick reference of damage.

Angle-of-Attack Indexer Shows your angle of attack.

ECM Light Indicates that your electronic countermeasures pod is turned on.

Flaps Light The Hornet has automatic flaps that adjust themselves for takeoff, cruise, and landing. Make sure the Flap Light is off for takeoff.

IFF Light Identifies the targeted aircraft as friend or foe when you press **N**.

G Limiter Light Indicates whether you've got the Hornet's G limiter switched on or off. The limiter limits your maneuvers to 7.5 Gs to prevent you from damaging yourself or your aircraft. Press the letter **O** to override the limiter.

AOA Limiter Light Indicates whether you've got the Hornet's AOA Limiter switched on (red) or off (green)—it's off by default. The AOA limiter limits the Hornet's AOA to 25% in order to prevent you from putting your aircraft into an unstable position (the Hornet can manage a 50° angle of attack, but it's dangerous). Press **Shift+O** to toggle the AOA Limiter on and off. In case you're wondering, the AOA Limiter is a feature added in the simulation—you won't find it in the aircraft itself.

UNDERSTANDING COCKPIT LOOK-DOWN VIEW

In cockpit look-down view, you see all the instruments below the level of the HUD, as shown in Figure 12.2. Press **K** (or **5** on the numeric keypad) to toggle between cockpit look-up view and cockpit look-down view.

Here's what you can see labeled in Figure 12.2:

Standby RWR The Standby Radar Warning Receiver shows what you would see on a DDI in radar warning receiver (RWR) mode when you do not have a DDI set to RWR mode. Otherwise, it's blank.

Standby Airspeed Indicator Shows your airspeed in hundreds of knots.

Standby Fuel Indicator Shows your remaining fuel in thousands of pounds.

Horizontal Indicator (HI) A navigation aid showing your aircraft from above. See *Reading the Horizontal Indicator* later in this chapter for details.

Standby Barometric Altimeter Indicates altitude with three needles: the short needle shows 10,000 feet, the medium needle shows 1000 feet, and the long needle shows 100 feet.

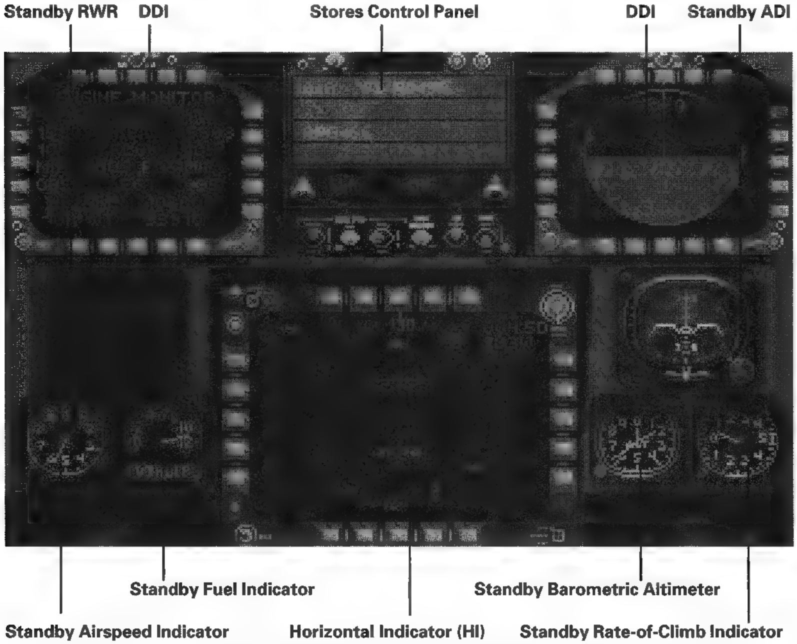

Standby RWR
DDI
Stores Control Panel
DDI
Standby ADI
Standby Fuel Indicator
Standby Barometric Altimeter
Standby Airspeed Indicator
Horizontal Indicator (HI)
Standby Rate-of-Climb Indicator

FIGURE 12.2 *Cockpit look-down view shows you the remainder of the instruments.*

Standby Rate-of-Climb Indicator Indicates the aircraft's vertical speed in thousands of feet per second.

Standby ADI The Standby Attitude Display Indicator shows the aircraft's pitch and roll.

Using Left View and Right View

In Left view (illustrated in Figure 12.3) you can see your backup compass, AVTR controls, and a landing gear light (red when the gear is up, green when it's down). In Right view (also shown in Figure 12.3), you see the Wing Hold Panel (which shows a red light when you fold the plane's wings for storage—**Ctrl+W**) and fifteen caution lights. The meanings of most of these are straightforward: FLAP, BURN (afterburner), RADAR,

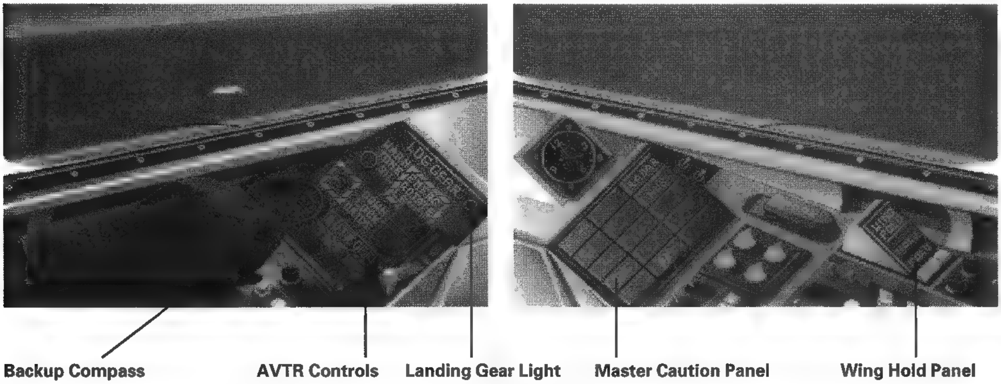


FIGURE 12.3 *Left view and Right view*

FUEL, HUD, NWS (nosewheel steering system), STORE (unable to launch or jettison external stores), OX LO (canopy damage and loss of cabin pressure—fly below 10,000 feet), ECM (electronic countermeasures pod destroyed), ENG (engine destroyed), JAM (cannon jammed), NAV (map display no longer functional), BRAKE (speed brakes stuck), ARM (arming mechanism for air-to-air or air-to-ground weapons destroyed), and WING (structural damage to the wings).

READING THE DIGITAL DISPLAY INDICATORS

The Hornet has three multifunction displays that can throw a bewildering array of data at you—two Digital Display Indicators (DDIs) and one Horizontal Indicator (HI), as shown in Figure 12.4.

Each DDI can display five types of data:

- Engine monitor
- Radar
- Maverick missile
- Radar warning receiver (RWR)
- Attitude display indicator (ADI)

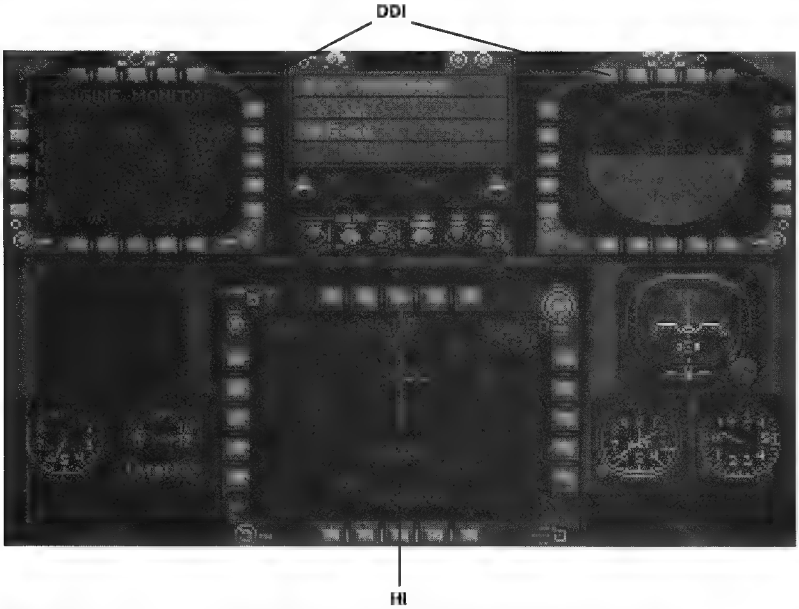


FIGURE 12.4 *The Digital Display Indicators and the Horizontal Indicator*

We'll look at what these displays show in the sections below.

NOTE

You can't have both DDIs showing the same information at once—nor should you want to.

The default setting is for the left DDI to show engine data and the right DDI to show the Attitude Display Indicator. To cycle through the DDI display options, press **Shift+;** for the left DDI and **Shift+'** for the right DDI. Press **Shift+K** to swap the left DDI display for the right DDI display.

The Engine Monitor DDI Display

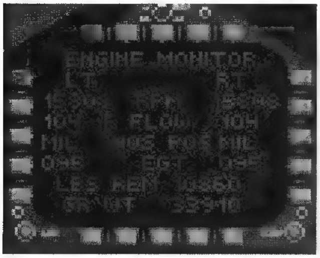
Here's what the engine monitor DDI display tells you:

LT and **RT** indicate left and right engines.

RPM shows revolutions per minute (not a percentage). Full military power is 19520 RPM.

F FLOW shows the number of pounds of fuel being used per minute.

NOS POS indicates the engine's nozzle position—**MIL** for military power, **AB*n*** for the five afterburner stages.



EGT shows engine gas temperature in Celsius.

LBS REM shows pounds of fuel remaining.

GR WT shows the Hornet's gross weight in pounds. (Maximum takeoff weight is 51,900 lb. for an attack mission and 36,710 lb. for a fighter mission.)

The Radar DDI Display

Like the F-16 and MiG-29, the Hornet offers several radar displays: Situational Awareness Display (SAD), Situational Awareness Mode (SAM), and High Fidelity Radar (HFR). These radar modes work in a similar way to those on the F-16.

NOTE

See Appendix C for details on using the High-Fidelity Radar.

Here's a quick look at what the Hornet radar shows. The illustrations in Figure 12.5 show the Hornet radar in SAD and HFR SCAN modes.

Note the B-Sweep Line in SCAN mode that moves from side to side to indicate the radar antenna scanning its horizontal range.

As with the F-16 radar, most of the radar modes indicate the current scan range (10, 20, 40, or 80 nm) and the horizon line to show the relationship of the aircraft to the horizon.

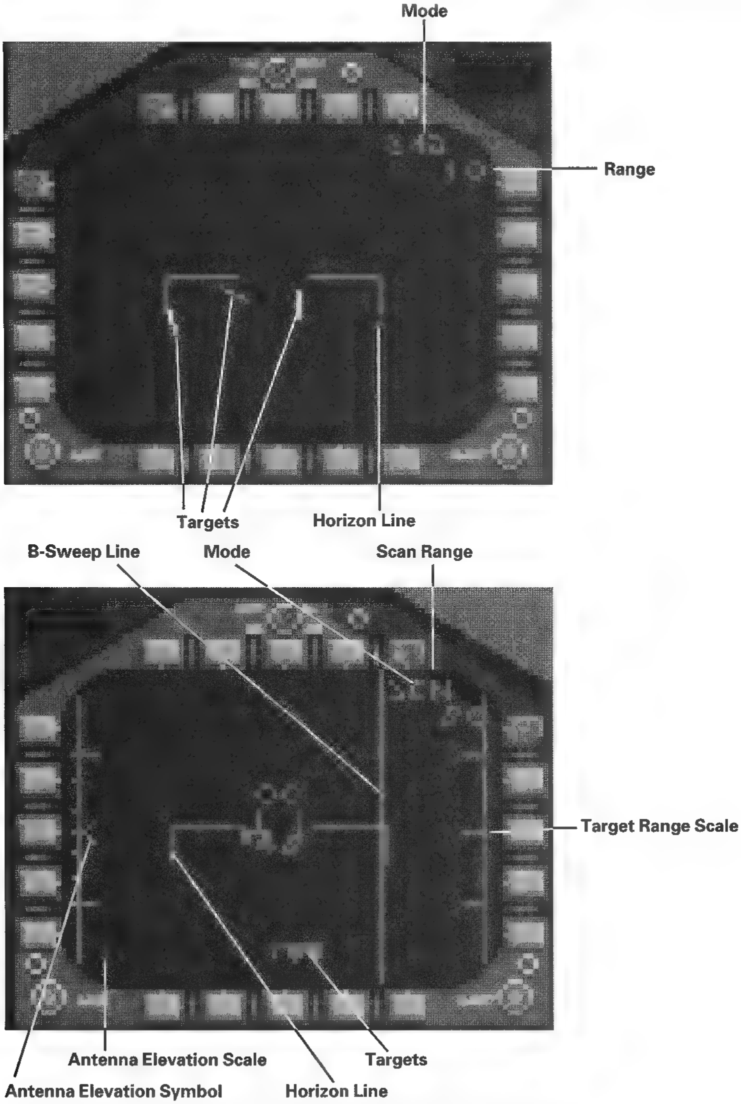
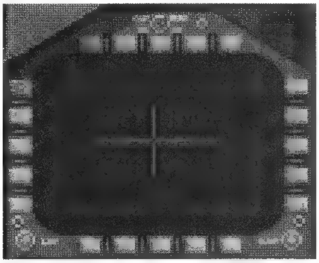


FIGURE 12.5 *The Hornet radar in SAD and HFR SCAN modes*



The Maverick Missile DDI Display

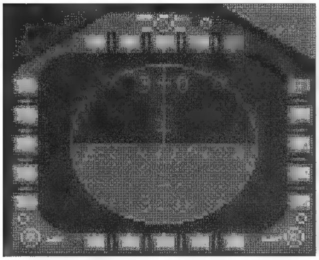
When you select a Maverick missile, you can switch to Maverick DDI mode by pressing **Shift+;** or **Shift+'**. In Maverick mode, the DDI shows a cross for targeting the missile.

The Radar Warning Receiver DDI Display

The Radar Warning Receiver, or RWR, is the Hornet's equivalent of the F-16's Threat Warning Indicator (discussed in Chapter 3)—it shows you enemy aircraft radars, SAM radars, and radar-guided missiles.

As mentioned earlier in this chapter, you can see the backup RWR in cockpit look-down view.

The Attitude Display Indicator DDI Display



The Attitude Display Indicator or ADI (illustrated here) shows the plane's relationship to the horizon with its two parts representing the sky and the ground. The wings of your plane remain fixed across the middle of the ADI while the artificial horizon moves.

There's a backup ADI that you can see in cockpit look-down view.

READING THE HORIZONTAL INDICATOR

The Horizontal Indicator (HI) is the third multifunction display in the Hornet's cockpit, located in the bottom center of cockpit look-down view. The HI is a navigation aid that gives you a God's-eye view of your plane.

The HI has three modes: Horizontal Situation Indicator display, which shows your Hornet inside a compass circle; Map mode, which displays the theater map on the HI; and Combined mode, which shows you the HSI symbols superimposed on the map. Press **C** to cycle through these three modes. Figure 12.6 shows the HSI and Map mode.

The Horizontal Situation Indicator shows you your aircraft as an icon in the center of the display together with the following:

Current Heading Pointer Your heading is shown at the top of the HSI; the compass rotates around your aircraft.

Current Waypoint Pointer A light + sign shows the direction in which you should be heading.

Current Radial Pointer A dark + sign on a light background shows your approach path to the waypoint.

Waypoint Deviation Scale The sliding scale above the aircraft icon, together with the **Radial Deviation Line** (a vertical line), shows how far you are off the direction for your waypoint.

THE HEAD-UP DISPLAY

The Hornet's HUD has three modes:

- Air-to-air mode, activated by pressing ↵
- Air-to-ground mode, activated by pressing **Backspace**
- ILS mode, activated by pressing \

Figure 12.7 shows the basics of the Hornet HUD. As you'll see, many of the features are similar to those on the F-16 and MiG-29 HUDs.

Heading Scale Shows your heading (at the cross) in degrees.

Waypoint Symbol Shows the direction of the current waypoint.

Airspeed Indicator Shows your speed in knots.

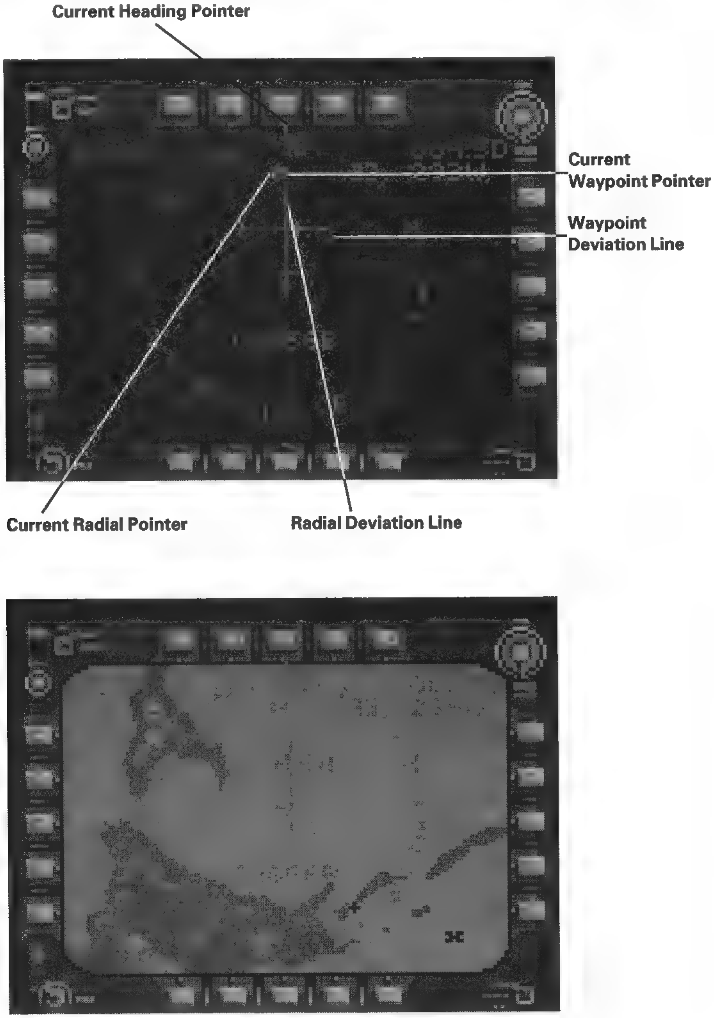


FIGURE 12.6 *The Horizontal Situation Indicator mode and Map mode*

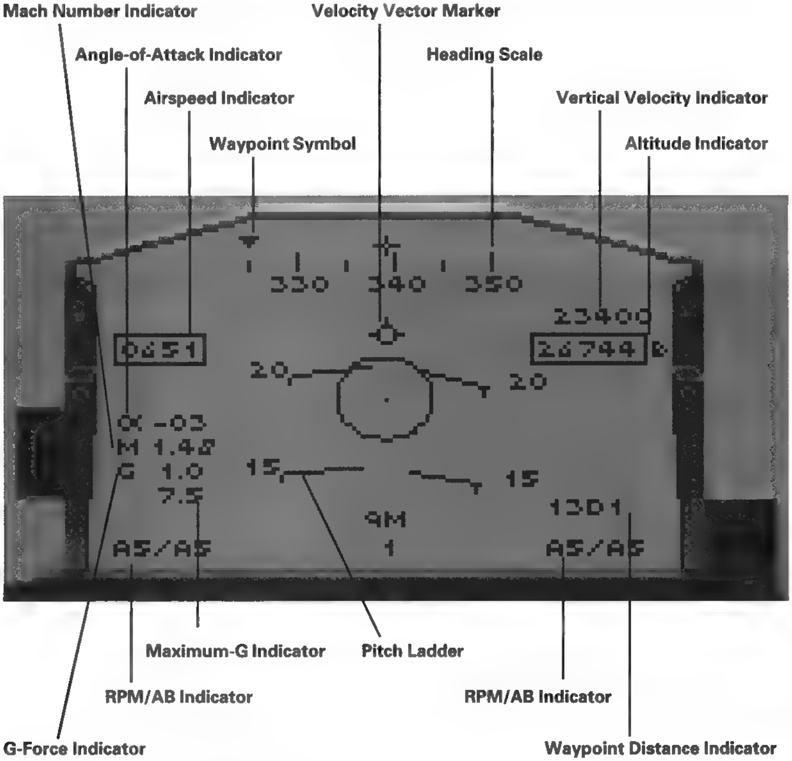


FIGURE 12.7 *The Hornet's HUD*

Altitude Indicator Shows in feet your barometric altitude (marked with a B) or your radar altitude (marked with an R). *Barometric altitude* is altitude above sea level; *radar altitude* is altitude above ground level. The default is for the HUD to show barometric altitude when you're more than 5000 feet above ground level.

Angle of Attack Indicator Shows the AOA in degrees.

Mach Number Indicator Shows your current speed in Mach fractions.

G-Force Indicator Shows your current G force (up to 9.9 Gs).

Maximum-G Indicator Shows the most Gs you've pulled in the current flight. There's no readout until you've pulled at least 4 Gs.

Velocity Vector Marker Shows the direction in which your plane is heading.

Vertical Velocity Indicator Shows your rate of climb (positive) or dive (negative) in tens of feet per minute.

Pitch Ladder Indicates whether the nose of your plane is pointing up or down, in five-degree increments.

Waypoint Distance Indicator Shows the number of your next waypoint and the distance in miles to it.

RPM/AB Indicators Show the current RPM status on the left and the throttle setting on the right. When you're using the afterburners, these indicators show the afterburner stages (A1, A2, etc.).

Using the Air-to-Air HUD

The air-to-air HUD on the Hornet shows you targeting information for the weapon you have selected:

Target Designator Box (TD Box) Indicates the target the radar is tracking.

Weapon Type and Quantity Indicates which air-to-air weapon you have selected—120 for AIM-120 AMRAAM, GUN for M61A1 cannon, etc.

Reference Circle Use this for aiming missiles.

Range Bar and Range Triangles Move the Range Bar so that it is between the Minimum Launch Range triangle (between two and three o'clock on the Reference Circle) and the Maximum Launch Range triangle (at six o'clock on the Reference Circle) to bring the target into range of the current weapon.

Target Locator Line Points toward a target outside the HUD.

Diamond X Indicates the direction of the TD Box when the TD Box is outside the HUD.

Target Range In miles and tenths of miles.

Closure Rate In knots.

Figure 12.8 shows the HUD for the AIM-9M Sidewinder.

The HUD for the M61A1 cannon (illustrated in Figure 12.9) has a range bar that shows the distance to the target in thousands of feet when you've got the radar switched on. If the bar is at 12 o'clock, the target is 12,000 feet away; six o'clock, 6000 feet, etc. You'll get best results at about 3000 feet or closer. Without the radar on, you'll see a simple aiming reticle.

TIP

The Hornet offers a couple of refinements that the F-16 doesn't. When you've got an enemy locked up, *SHOOT* will flash at you on the HUD; and when you're too close to fire a missile at an enemy, the *breakaway X* will appear—a large cross through the Reference Circle. Either choose a weapon more suitable for the distance or break off the attack.

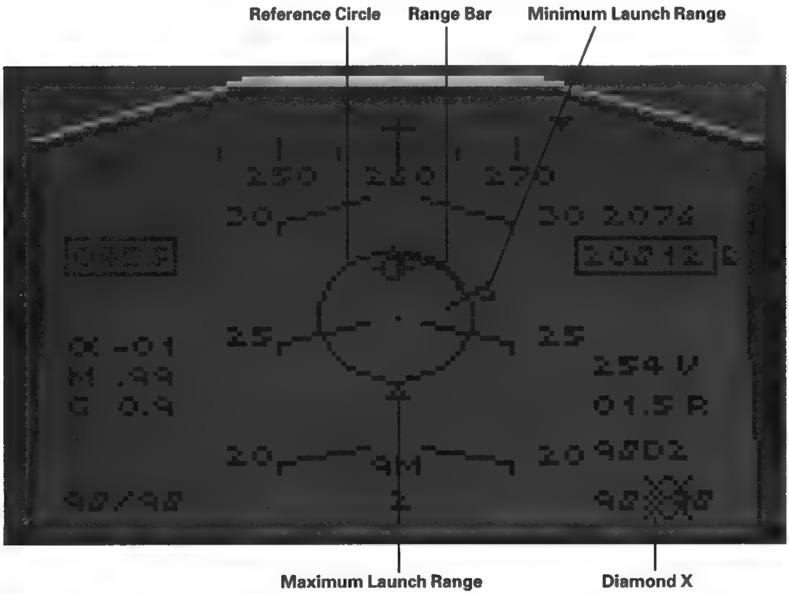


FIGURE 12.8 *The AIM-9M Sidewinder HUD*

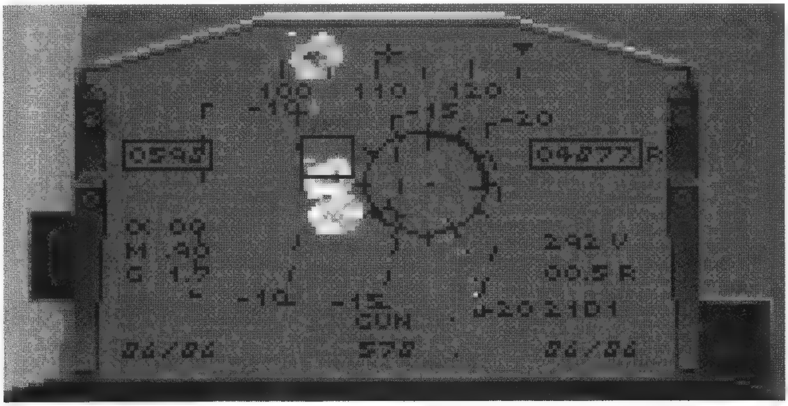


FIGURE 12.9 *The M61A1 cannon HUD display*

Using the Air-to-Ground HUD

The Hornet has four air-to-ground HUD displays, which are very similar to those on the F-16. You use the MVRK HUD mode for launching Mavericks and guided bombs; the CCRP (computer controlled release point) is for dropping iron bombs and works in a similar way to CCIP on the F-16; STRF is for strafing with the M61A1 cannon and firing LAU rockets; and A-R is for launching anti-radiation guided missiles (e.g., the Shrike or the HARM).

The STRF and CCRP HUD modes indicate your true airspeed, weapon type and quantity, and HUD mode.

In STRF mode with the radar on, you'll see a reference circle and range bar for targeting your weapons. These work in a similar way to the air-to-air reference circle and range bar for the M61A1 cannon; try to bring the range bar to less than five o'clock (i.e., closer than 5000 feet) before firing.

NOTE

In air-to-ground modes, the breakaway X will warn you that you're getting too close to the ground.

FLYING THE HORNET

Unlike MiG-29, Hornet doesn't include new training missions, but you can use some of the Falcon 3.0 training missions (updated by your installation of Hornet) to get you acquainted with the F/A-18 and what it can do. Look back to Chapter 7 for details on the Falcon 3.0 training missions.

The two most important new maneuvers you need to learn for the Hornet are takeoff and landing using aircraft carriers, since your Hornet will be based on a carrier for all campaigns other than Pakistan. We'll look at these carrier maneuvers in the sections below.

CARRIER TAKEOFFS

There's only one problem with taking off from an aircraft carrier—the deck just isn't long enough for the Hornet to get up to takeoff speed (about 150 knots) without a little extra assistance. So the carriers have catapults to get the Hornet up to takeoff speed pronto.

Here's how to take off from a carrier:

1. Wind up your engine to full power by pressing + to increase the RPM.
2. Engage the afterburner by pressing \, then go to full afterburner—stage AB5—by pressing > four times.
3. Pull your joystick all the way back and hold it there.
4. Press **Alt+C** to fire the catapult. You'll find yourself hurtling along the deck.
5. Once you're airborne, ease the stick forward till the Pitch Ladder shows about 10%.
6. Press **G** to retract your landing gear.

Figure 12.10 shows the stages of a successful takeoff.

For whatever reason, Hornet is quite forgiving about your forgetting to use the catapult and stalling off the end of the deck—it lets you bounce off the sea, as shown in Figure 12.11. This is not a great habit to get into, but you may want to do it occasionally for entertainment. The autopilot enjoys bouncing off the sea so much that he'll do it given half a chance—so I'd suggest you don't let him perform takeoffs for you. Why can you get away with this? Well, in Hornet (and the other Falcon simulations), water is simply "blue land"—land colored blue. It doesn't have any attributes that'll stop you landing in it.

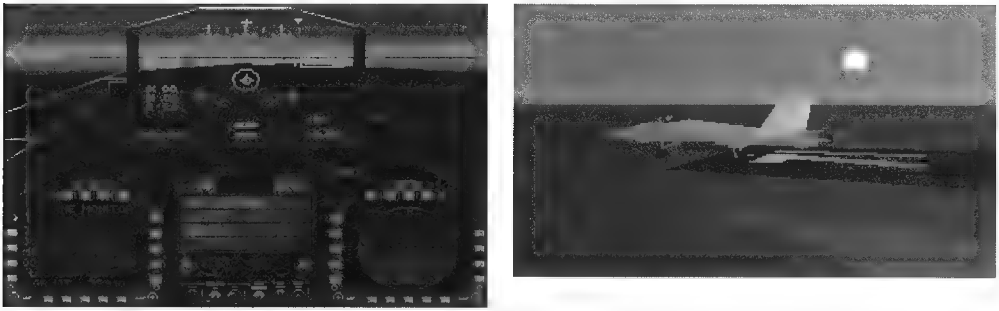


FIGURE 12.10 *Taking off from a carrier using the catapult*

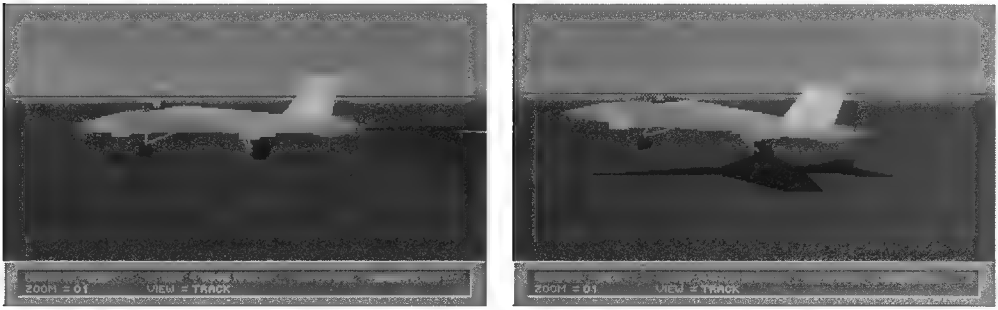


FIGURE 12.11 *If you forget to use the catapult, you won't be going fast enough to take off by the time you've reached the end of the deck and will stall into the sea. Fortunately, Hornet lets you bounce back into the air…!*

CARRIER LANDINGS

If your landing technique still stinks like a bear's shorts even after constant practice with the F-16 and MiG-29, you're going to hate carrier landings, because they're much harder yet. Not only is the carrier too short to land on without a special technique—wires across the deck to stop the plane—but it'll be moving to boot. Don't worry too much yet—there are a couple of things to help you here, and we'll get to them in a minute.

The first thing to do is to get yourself into a suitable position for landing. Aim to be at about 1200 feet when you're eight miles out from the carrier, and to be approaching it from dead astern.

If you can see the carrier, you should aim to carry out a *visual* or *pattern* landing that follows the landing pattern, a counterclockwise circuit with the carrier in the middle of its upwind side.

The Carrier Air Traffic Control Center (CATCC—identified as Home Plate) will direct you to enter the landing pattern at one of four entry points:

- The **crosswind entry point** is one to one-and-a-half miles straight ahead of the carrier. You'll be approaching from the carrier's right side, then swinging to your left to pass it on its left side on the downwind leg.
- The **downwind entry point** is at the top of the downwind leg, at the carrier's ten o'clock.
- The **base entry point** is at the end of the downwind leg, at the carrier's eight o'clock.
- The **standard overhead recovery entry point** is four miles due astern of the carrier. This is the ideal place to enter the pattern.

NOTE

You have to contact the carrier (press Alt+H) on your approach. It will then direct you to the appropriate entry point.

The CATCC will direct you to enter the pattern with a message such as *Enter standard pattern* or *Enter pattern on downwind.*

From the standard overhead recovery pattern, follow the pattern around like this:

1. At the standard overhead recovery point, reduce your speed to 250 knots. Aim for a height of 800 feet above ground level.
2. Press **H** to drop the tailhook.
3. Fly straight and level over the carrier and note your heading. Then bank 90° left into the crosswind leg. Lower your gear by pressing **G** and reduce your speed to 180–200 knots.
4. Keep banking left into the downwind leg, on the opposite heading from that at which you passed over the carrier, and descend to 600 feet.
5. You'll hear *You are cleared to land* from Home Plate (CATCC). This means the CATCC is handing you off to the Landing Signal Officer (LSO).
6. When you're a mile beyond the stern of the carrier, bank left into the base leg of the pattern. Reduce your speed to about 140 knots and come down to 450 feet AGL.
7. The LSO will tell you whether the deck is *clear* or *fouled*. If it's clear, bank until you're lined up with the carrier. If it's fouled, you'll need to fly the pattern again.
8. Listen to the LSO messages that guide you in (see the sidebar) and adjust your approach accordingly. Use the stick, rudder, and throttle to hold the right configuration.

WARNING

The centerline of the landing deck is 10° to port of the carrier centerline—make sure that you're heading in the right direction so that you don't decorate its superstructure.

9. As your wheels hit the deck, open up the throttle in case your hook misses the wire and you need to take off again.
10. As soon as your hook catches a wire, slap the throttle closed and press **W** to engage the wheel brake.
11. Taxi to the side of the carrier (*not* over the side!), press **Ctrl+W** to fold your wings, and park the plane.

WARNING

In the final seconds of approach, you'll need to use the *throttle* to control altitude and the *stick* to control your speed, rather than the other way around. Because you're coming in at such a low speed, pulling back on the stick will cause you to stall rather than gain altitude.

This all sounds pretty straightforward on paper, but in the cold light of the ocean you'll find it takes lots of practice to set a Hornet down on a carrier safely. You can judge your success by the grade the LSO gives you: Perfect, Good Landing, Fair, No Grade (poor but safe), or Unsafe.

COMMUNICATING WITH THE LSO

Once you're on your final approach to the carrier, the Landing Signals Officer becomes the voice of God. He'll let you know how you're doing and if there are any problems.

The most vital message from the LSO is *The deck is clear*. Until you hear this, no way should you be trying to land. If you hear *The deck is fouled*, be prepared to stooge around until it's clear.

The LSO will notice if you've forgotten to lower your gear or your hook and will warn you so that you can lower it. He'll also warn you if you're high or low, or drifting left or right. Again, remedy matters immediately.

If you've got everything right, you should hear *Gear down, hook down, roger ball* from the LSO. This means you can follow the "meatball," a stack of three deck lights to the left of the landing strip, to check your relationship to the glideslope. The meatball uses red lights to indicate that you're too high (you'll see the red light above the green lights) or too low (below the green lights). If you're on the glideslope, you'll see only the green light.

(In case you've been wondering, the Hornet simulation gives you a little extra help here. On a real carrier, the pilot uses the meatball without comments from the LSO, except at night and in bad weather.)

There are four LSO messages whose meanings you absolutely must know:

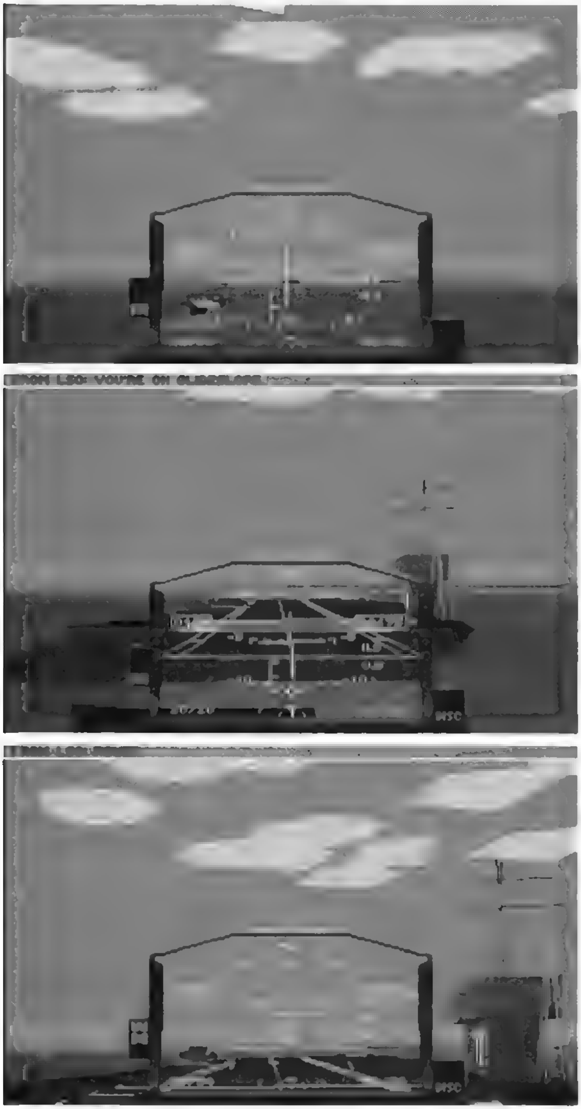
- *Wave-off* means that you must abort your landing and follow the pattern around again.
- *Bolter!* means your hook missed the wires and you'll be in the drink in a second. Pile on the power—full throttle and afterburner— and take off again.
- *Power!* means that you need to increase throttle to land safely.
- *Climb!* indicates that you are too low—you're in danger of repainting the stern of the carrier red.

Instrument Landings

In poor visibility, or if you're short of fuel or your plane is damaged, you'll need to perform an instrument or *straight-in* landing instead of a visual landing. (You can also try this if you're not up to holding the pattern all the way around the carrier.)

To arrange an instrument landing, you need to be about 10 miles behind the carrier, within a 45° cone behind the landing deck, 1200–5000 feet above ground level, and doing less than 300 knots. Simply fire up the ILS by pressing \, and press **Alt+H** to call up the LSO, who will then guide you in. Use the ILS as you learned to do for landing the F-16 in Chapter 7.

Figure 12.12 shows an instrument landing (in good conditions, so that you can see what's going on).



FROM LSO: YOU'RE ON GLIDESLOPE

FIGURE 12.12 *Three stages of an instrument landing on a carrier*

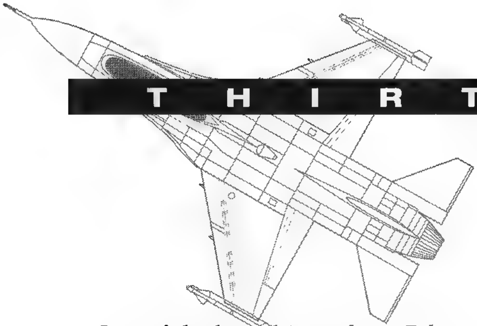
Landing by Autopilot

If you're feeling lazy or your landing skills are lousy, you can have the autopilot do the job for you. Press **A** to engage the autopilot for a visual landing. Alternatively, to have the autopilot perform a straight-in landing, engage the automated carrier landing system (ACLS) by pressing \ and then **A**.

And if your autopilot's been shot to pieces, you can always land in the sea next to the carrier....

ADVANCED FLYING TACTICS

THIRTEEN



THIRTEEN

One of the best things about Falcon 3.0 is that you can train yourself as you go—improve your reactions and maneuvers in Instant Action, train yourself formally in Red Flag, and develop your strategic sense in Campaign.

By now, if you've been following through this book, you'll know how to fly the F-16, FSX, MiG-29, and Hornet with a reasonable degree of success. You may have become a seasoned squadron leader with a number of successful campaigns under your belt—and God knows how many hours of combat experience in Instant Action—without having had to worry about book learning, theoretical maneuvers, or even thrust-to-weight ratios.

But you can only get so far with seat-of-the-pants flying; and the time has come (the Walrus said) to speak of advanced fighter tactics. Before we get into this, let me stress that this chapter is merely a brisk overview, and that when you're serious about being a fighter pilot, you should consider getting some of the books that detail these strategies and maneuvers. (In case you're asking, I'd recommend *Fighter Combat Tactics and Maneuvers* by Robert L. Shaw [Naval Institute Press]—but light reading it's not.)

GETTING INTO WINNING POSITIONS

By now, I shouldn't need to tell you that your main aim in combat is to down the other guy. To do so, you need to get your aircraft into a position from which you can loose your weapons at him. Dead astern of him is an ideal position for this. Technically, this is *offensive* maneuvering.

NOTE

In any combat situation, you need to exploit the enemy's weaknesses and use your own strengths. Study the aircraft you'll be facing so you can identify their weak points.

At the same time, you need to stop the bandit from getting a shot off at you by moving your aircraft out of positions in which he can fire on you. This (you guessed it) is *defensive* maneuvering—saving your six.

The third type of maneuvering is *head-on* maneuvering—trying to get behind the bandit from a neutral position.

You'll appreciate that these three types of maneuvering inevitably blend into one another in a dogfight. Don't worry too much about which you're doing—just concentrate on protecting your six and laying your weapons on the enemy.

TIP

Your first priority in any fight is to gain the upper hand and put the bandit on the defensive. While he's in a position to shoot at you, you're at a serious disadvantage.

As I mentioned in Chapter 5, you need to keep your energy high in any dogfight. When you perform maneuvers, you exchange energy (dictated by speed and altitude) for aircraft position. Turning and pulling Gs will cost your aircraft energy, and you'll need to adjust the thrust and afterburners to keep your energy up and your aircraft at *corner velocity*, the maximum speed at which it can turn fastest. For the F-16 and Hornet, this is about 400 knots; for the MiG-29, it's 435 knots at 15,000 feet.

Because of the speed at which air combat takes place, you need to maneuver on the basis of where your opponent's aircraft *will be* rather than where it *is*—just as you would when throwing a football to someone who's moving, but here you have to consider the vertical dimension as well.

Before you try out any of these maneuvers, you need to know a few terms so that you can understand what I'm talking about in the next sections:

Positional Geometry is how you describe one aircraft's position relative to another. *Range* is how far the bandit is from you; *aspect angle* is the angle in degrees between your aircraft and the tail of your target; *angle-off* (or *Heading Crossing Angle, HCA*) is the difference in degrees between your heading and the bandit's heading.

Attack Geometry is how you approach the bandit: *Pure pursuit* is when your aircraft is pointing directly at the bandit; *lag pursuit* is when you're pointing behind him; and *lead pursuit* is when you're pointing ahead of him.

TIP

Use the Flight Path Marker on the HUD to tell which pursuit course you're flying.

The **Weapons Envelope** is the area around an enemy plane in which a missile or shell would hit it. An all-aspect weapon (such as an AIM-9M) has a donut-shaped weapons envelope—an area all around the enemy, its size dictated by the weapon's minimum and maximum range, and a rear-aspect weapon (such as an AIM-9P) has a cone-shaped weapons envelope behind the enemy aircraft. You need to consider the weapons envelope when deciding which weapon to use against an enemy—in head-on maneuvering, firing a rear-aspect missile won't do you any good.

The **Control Zone** is the position behind an enemy aircraft in which you can remain in control and shoot at him. If you're about to run the enemy down, you're not in a suitably controlled position to shoot at him. (We'll get to how to deal with this particular situation in a few pages.)

Turn Radius is the distance from the center of the turn to the aircraft, and indicates how tightly your aircraft is turning. Turn radius is equal to (velocity squared) divided by (gravity multiplied by the number of Gs you're pulling). Don't worry too much about that, but understand two things: First, the more Gs you're pulling, the more tightly you'll turn; and second, the faster you're going, the wider your turns are going to be—and since velocity is squared in the equation, the turn radius increases exponentially rather than arithmetically. This is why you want to keep your airspeed around corner velocity, not higher—so that you can turn sharply without cavorting all over the sky.

TIP

On air-to-ground strike missions, when your aircraft is loaded with bombs, keep the speed higher—550 knots or so. Once you start turning, you'll soon bleed off the extra airspeed.

Turn Rate is how fast your aircraft is turning in degrees per second. You'll need a high turn rate to get into attacking positions against enemy aircraft.

ENGAGING A SINGLE ENEMY

By now, you should be able to detect and observe bandits by using the HUD, the REO, and the Threat Warning Indicator on your aircraft (if not, look back at the earlier chapters of this book for guidance). Use these instruments to determine the direction the bandit is heading, and try to get behind him—preferably without him noticing you.

Once you find yourself behind a bandit, don't hesitate—shoot at him the second you get a chance. It may be the only chance you get, especially if you blow it.

When a bandit detects you on his six and starts to maneuver to get away, you need to anticipate his moves and take appropriate action to keep yourself in a good position.

Once a bandit starts turning to get away from you, start turning in the same direction. You need to keep inside his turn circle so that he can't turn to face you and force a head-on pass. Now maneuver to lead pursuit, so that your Flight Path Marker is ahead of the bandit.

- If you're in lead pursuit and the bandit moves back under your nose, adjust your turn so that he flies back into view, and then move to lag pursuit until you close in.
- If the bandit is out-turning you, you'll see yourself go from lead pursuit to lag pursuit. Lower your speed and turn as sharply as possible to avoid overshooting him.

Check your closure rate in the bottom-right corner of the REO if you have a chance. Aim to be closing at 50 knots.

Once you get the bandit within range and in your sights, let him have it.

Getting a Bandit off Your Six

Sooner or later, you'll find yourself in precisely the position you *don't* want to be in—with a bandit on your six getting ready to wax your ass. You need to react immediately; here's how.

Turn at maximum G toward the bandit; use the Threat Warning Indicator to determine his direction. If you can't work out where the bandit is, just turn like hell anyway. Turn to bring him to your 12 o'clock position—directly in front of you—so that you can go on the attack.

If you're turning fit to bust a gut but you're not bringing the bandit around in front of you, you've got a problem. If your speed's high—over 450 knots—reduce it so that you can turn more sharply; either press the – key to lower your thrust, or press **B** to toggle the speed brakes on. If your speed's lower than corner velocity, pile on the afterburner to reach corner velocity.

If neither of those measures work, you'll have to take more drastic action. Hit **Ctrl+K** to jettison your external stores. That'll reduce drag and improve your aircraft's performance—but you won't have as many weapons to use against the bandit. You'll also lose important stores such as your ECM jammer and extra fuel tanks, if you're carrying them—so even if you wax the bandit, you'll probably need to head for home afterward rather than continue with the mission.

TIP

As soon as you detect a missile launched against you, pump out chaff (press Del) and flares (press Ins) against it. (If you detect a lock-on before a launch, don't bother with the flares.) If you've loaded an ECM jammer, turn it on by pressing E. Turn sharply to help throw the missiles off. If you can work out where they're coming from, try to turn away from them. If you don't know where they're coming from, just turn sharply anyway. Remember that you can use Padlock view to spot missiles.

TIP

If you're not averse to a little, like, *adjustment* of reality, you can get away in Falcon 3.0 with maneuvers that'd plant you in real life. Deliberately losing 20,000 feet of altitude in a wig-out spin isn't recommended in a real F-16 (or MiG-29, or Hornet…), but it's a great way of getting out of a dogfight and saving your ass in Falcon 3.0. How to get out of the spin before you hit the deck? Press Ctrl+Alt+5 (that's the 5 on the numeric keypad) to autolevel the plane. (If you black out, as you richly deserve to when pulling a stunt like this, switch to an outside view so that you can track your altitude and avoid going farming.) Now you can feel thoroughly disgusted with yourself… but you're still alive, aren't you? Quit griping and go kill someone.

TAKING ON A BANDIT HEAD-ON

While taking on a bandit head-on has a certain macho appeal, it's not a great idea in air combat, because the bandit has just as good a chance to shoot at you as you do at him. But sometimes a man's gotta do what a man's gotta do… so here's what you gotta do.

Maneuver to bring the bandit into your 12 o'clock position. Then get the first shot in: Loose a Sidewinder or three as soon as you get the bandit in range. If you're down to guns, you'll need to be within two miles before you can reasonably hope to hit him.

WARNING

Don't ram the enemy—this is air combat, not a game of chicken. If you have Collisions switched on in the Difficulty Levels screen, you'll destroy both aircraft; and if you have Collisions switched off, you'll simply fly through each other. Neither does you much good.

Once the bandit fires at you, take evasive action as described in the previous sections.

If neither of you downs the other, you and the bandit will pass each other at high speed. Immediately turn hard to follow him and try to get on his six. Remember that he's likely to try to do the same to you. Now use your aggression, pin him, and nail him to the ground.

ENGAGING MULTIPLE ENEMIES

The first thing to know about fighting multiple enemies on your lonesome is that you should try to avoid doing so whenever possible. Instant Action aside, try not to get into protracted dogfights—they're bad for your health, often permanently. The best way to take out enemy aircraft is to engage them singly, sneaking up on them when their attention is elsewhere, and blowing them to pieces before they know what's hit them—"like a hard rock cast onto eggs," as Sun Tzu put it. What this lacks in glamour, it makes up in practicality: If you get into a long turning fight, you're liable to find other bandits arriving to complicate the process and show you the way to dogmeat city.

But when you do get into a dogfight with multiple enemies, here's what you need to do:

- Lower (or even) the odds as quickly as possible by taking out the nearest bandit. He's the one you've got the best chance of killing right at the start of the fight.
- Take out as many bandits as possible at long range.

- Avoid getting sandwiched: Keep all the bandits to one side or the other of you, or above or below you.
- Concentrate on the most immediate threat. If you've got a bandit on your tail, your first priority is to shake him off before he stitches you up—not to find yourself a target, even if a juicy one should present itself.
- If things are going badly, make yourself scarce. Engage the afterburner, rack it up to AB5, and depart the scene.

Using Wingmen to Even the Odds

If you have wingmen in a turning fight against multiple bandits, you'll enjoy better odds, but most of the principles of one-on-many dogfighting still apply.

You'll remember from Chapter 8 that you can order your wingmen to perform various maneuvers: break left or right, high or low; fly straight and level; bypass the current waypoint or return to the previous waypoint; bracket left or right; engage and disengage; and drag left and right. (In Operation: Fighting Tiger and later versions of Falcon 3.0, you can also order them to close up or spread out the formation.)

- Order your wingman to break left or right, high or low, when you see that he's got a bandit on his six. He'll perform a maximum-G turn into the bandit.
- Order your wingman to bracket left or right when you're approaching a formation of bandits and want to pincer them. You'll do best to order a bracket while the bandits are still more than 15 miles away.
- Order your wingman to engage when you want him to attack the nearest bandit. Order him to disengage when you need to depart the dogfight.

WARNING

Ordering a drag inside ten miles of the bandit opens you up to the bandit's medium-range missiles. Note that you can't order a vertical drag, either up or down.

- Order your wingman to drag left or right when you want to decoy the enemy with an easy target. Then sneak behind the enemy and do the dirty deed.

To counter a bracket that the enemy pulls on you, use your instruments to track their positions. When they're on either side of you, order your wingman to break toward the one on his side, and break toward the other yourself. The better enemy pilots know this maneuver too, so be prepared for them to try it on you when you attempt to bracket them.

The bandits may also try a drag on you. Keep your wits about you at all times, especially when you find a tempting target flying all unsuspecting in front of you—chances are you've been drawn to the tethered goat. If you detect a bandit lurking into a position to get behind you, order your wingman to break toward him. This will give your wingman a head-on confrontation with the second bandit, and you should have a good shot at taking the bait.

WICKED ACROBATICS FOR WINNING DOGFIGHTS

Here are advanced maneuvers that you can use to put yourself in winning positions in dogfights.

The **Immelmann turn** is the jet variant of the maneuver to change course rapidly made famous by German ace Max Immelmann in World War I. In the jet Immelmann, you perform a half-loop upward so that you're heading back the way you came, and then roll level. Make sure your speed is above 550 knots, and then pull back on the stick to climb into the loop. You may black out for a moment, but don't worry—the Gs will drop as soon as the plane is inverted. Push the stick forward and level out—inverted—when the pitch ladder nears 0°. Finally, roll the right way up by putting the stick hard over to the left. You'll lose speed but gain altitude—probably 3000 or 4000 feet—when you perform an Immelmann. So it's a safe maneuver to perform at low altitudes *provided you've got enough speed.* If your speed's not high enough when you perform an Immelmann, you'll stall—which can be messy at low altitudes.

NOTE

In case you're wondering, the Immelmann conveys advantage but not invincibility. Immelmann lasted till 1916 before buying the farm.

The **Split-S** is like a backward Immelmann—you perform a half-loop downward, losing lots of altitude (usually between 7000 and 10,000 feet) but gaining speed. Make sure you've got enough altitude, and then perform a half-roll so that you're flying upside down. Next, pull the stick back to dive in a half-loop. As with the Immelmann, you may black out; the problem with the Split-S is that the blackout won't fade until you pull out of the half-loop—so you need to estimate when the Pitch Ladder will be approaching 0°, and level your plane at that point. You'll appreciate that altitude rather than speed is the crucial factor when deciding to perform a Split-S—if you don't have at least 7000 feet you can safely lose, don't try a Split-S.

The **Scissors** is a great maneuver to know when you've got a bandit on your six about to rearrange your rear end. In the Scissors, you turn to one side to force the enemy plane wide of you, turn the opposite way and lower your airspeed to put a little space between yourself and the enemy, turn the original way again so that the enemy crosses your path *in front of you*, and then double back again to bring him into your sights. Here's how: Once you know there's an enemy behind you, bank 90° to the side he's on (let's assume left for clarity here). If he responds by moving wider to that side, bank right 90° after a few seconds and ease back on the throttle to drop your airspeed.

NOTE

If the bandit responds to your maneuvers in a different way, you'll have to adjust your subsequent moves accordingly. Generally speaking, enemy pilots with lower logic levels will fall for the Scissors, while more experienced pilots won't.

Straighten out and check on the enemy aircraft again. If he's still out to your left, bank 90° left again and reduce throttle further to cut across behind him. Then bank right again to bring yourself into position behind the bandit, take aim, and loose your weapons.

The **High Yo-Yo** (named after a pilot, incidentally, not the toy) is a good maneuver for when you find yourself overrunning a slow target from behind before you can shoot at it. You pull back the stick so that you climb sharply—thus bleeding off airspeed—and at the same time perform a half-roll that lets you observe the bandit through the cockpit canopy. At the top of the climb, pull the stick back so that your aircraft dives sharply at the bandit. Fire when you get within range, and turn your aircraft rightway up once you've passed the bandit.

The **Barrel Roll** is another maneuver to use when you realize you're in danger of overshooting a slower-moving bandit. Pull the stick back to climb and at the same time move it to the left, so that the plane rolls during the climb. Because your plane is rolling, your course will spiral around the bandit's course (seen from in front or behind). Climbing will lower your airspeed, and you'll come out of the barrel roll behind your target.

TIP

You can also use the barrel roll when a bandit gets behind you to force him to overshoot you and to put yourself in position behind him. Bear in mind that unless the bandit is very close behind you, he'll be able to follow you into the barrel roll—meaning you'll still be screwed. Consider applying your speed brakes (by pressing B) to force the bandit to get within ultra-close range before executing the barrel roll.

The **Rolling Scissors** combines the Scissors and the Barrel Roll (both described above). Instead of using just the horizontal dimension to force your opponent to overshoot you and to put yourself in a firing position, you use the vertical dimension as well. In the Rolling Scissors, your aircraft's flight path will describe a corkscrew around your opponent's flight path—which itself will probably not be straight.

The **Zoom Climb** is useful if a bandit tries to gain an advantage over you by climbing during head-on maneuvering and you've got a good amount of speed up. Sustain the climb until the bandit runs out of energy and stalls, and then roll inverted and dive after him to bring yourself into a good firing position.

NOTE

When dogfighting with a bandit that can out-turn you—for example, a MiG-19 can out-turn an F-16—use vertical maneuvers to gain the advantage.

The **Vertical Scissors** is a good maneuver to know if a bandit forces a zoom climb, but be careful not to outclimb him unless he stalls—otherwise, he'll have a perfect shot at your six the moment you climb ahead of him. If you find yourself forced into a zoom climb with a bandit, try to execute the Vertical Scissors: Wait for him to lose speed so that he has to roll out of the climb, give him a second to move away from you, and then roll over and dive to get on his tail.

TIP

You can also execute a Descending Vertical Scissors, in which you slow your rate of descent during a dive to force the bandit ahead of you. Try the Descending Vertical Scissors if you're at a speed disadvantage vis-a-vis the bandit and it would be unwise to attempt a zoom climb—in the Descending Vertical Scissors, the aircraft going at the lower speed has the advantage, since the pilot can slow it down more quickly.

BOMBING MISSIONS

Chapter 4 discussed how to load, select, aim, and drop the bombs that the F-16 can carry. As you'll have found out if you've been practicing, the vital thing for successful bombing missions is to approach your target correctly.

There are three basic ways of approaching your target:

A **low-altitude, level-delivery** approach is useful mainly for CAS missions, in which flying low can help you identify enemy vehicles, and for evading radar. This type of approach doesn't help you identify targets as much as you might expect it to, since the target will be hidden by the nose of your aircraft until you dive at it.

WARNING

Remember that dropping powerful bombs from low altitudes can wreck your plane as well as the target. For low-level runs, use Snakeyes rather than regular Mk-82s, or use cluster bombs.

A **medium-altitude, shallow-dive–delivery approach** is what you'll probably use for most of your bombing missions. Fly at around 15,000 feet until you're about seven miles away from the target, and then perform a shallow dive—10° or 20°—that brings the target into view and gives you plenty of time to designate the target and release the bombs before pulling out of the dive with plenty of altitude remaining.

A **high-altitude, steep-dive–delivery approach** (25,000–30,000 feet) gives you even more time to aim the bombs but makes it more likely that the enemy will detect you.

Whatever the approach you're going to use, study the mission route carefully, make detailed plans, and set your waypoints accordingly. Zoom in on the target in the Set Waypoints screen so that you know exactly what to look for when you get to the target—bombing the wrong target, or even the wrong building, is wasteful and embarrassing (and we're not even going to *think* about friendly fire here...).

Make only one pass over the target, and get it right—stooging around a target or having to make a second pass at it is likely to bring fire and brimstone down on you and your wingmen. Then depart the scene in a hurry and head for home. Your goal in any strike mission is to take out the target and at the same time minimize your exposure to threats.

TERRAIN MASKING AND NAP-OF-THE-EARTH FLYING

As you'll know from war movies, one way to avoid radar is by flying close enough to the ground to either hide behind features of the landscape—*terrain masking*—or to make the radar think you're part of the ground—*nap-of-the-earth* or *NOE* flying. Terrain masking and NOE flying have two main disadvantages: First, if you're not extremely careful, you may in fact become part of the ground you're using to hide your plane; and second, you'll be low enough to receive small-arms fire in painful places from enemy ground troops, not to mention be at risk of AAA. Set yourself some low-level training missions in Red Flag before you go tree-pruning in Campaign. You'll find low-level flying especially taxing with lower levels of detail set in the configuration screens.

POP-UP ATTACKS

While low-level flying is a great way to approach your target without being detected and thus evade the enemy's defenses, bombing at zero feet isn't such a hot idea unless you and your aircraft are wearing Kevlar underwear. Not only are you likely to blast yourself as well as the target, but you'll have a hard time targeting your weapons precisely with low-level approaches.

Enter the pop-up attack, in which the attacking aircraft fly most of their mission at low altitudes, and then climb sharply a short distance before the target to give them a suitable approach to it.

To have your flight execute a pop-up attack, set low-altitude waypoints along the route until the final waypoint before the target. Set that waypoint to an altitude high enough—and far enough from the target—to give the flight a good approach to the target. Set low-level waypoints for the return to base.

TIP

You can also define a decoy flight to precede your flight to its target, and then break away, drawing enemy aircraft with it and allowing the main flight the luxury of an uninterrupted bombing run at the target. To bring down the full wrath of the enemy on your decoy flight, have it fly at a conspicuous altitude while the main flight flies nap-of-the-earth and from a different direction. Arm the decoy flight with plenty of weapons for an air-to-air engagement, and don't slow them down with bombs they won't need.

AVOIDING SAMS AND AIR-TO-AIR MISSILES

A vital skill in Falcon 3.0 is avoiding the SAMs and air-to-air missiles that come winging your way with your name writ large on their casing. In particular, watch out for the SA-6 Gainful and the SA-8 Gecko; the Gainful will appear on your Threat Warning Indicator as a square containing a 1, and the Gecko will appear as a square with a 2.

As discussed earlier in this chapter, your main defenses against missiles are the ECM jammer (**E**—provided you loaded one on your aircraft in the Load Armaments screen), the flares (**Ins**), and the chaff cartridges (**Del**). Remember that you can track incoming missiles in Padlock view to determine what they are and see how well your countermeasures are working. But don't rely on the countermeasures alone—you should also be busy getting the hell out of the way of the missile in case it eludes what you're throwing at it.

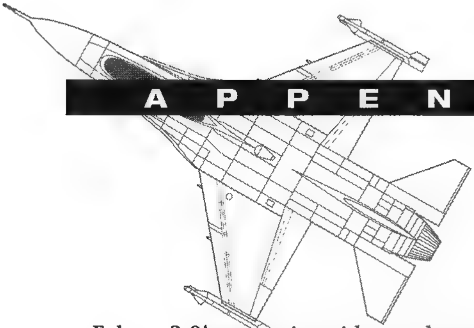
TIP

You can turn Limited Chaff and Flares on and off in the Difficulty Levels screen; see Chapter 2 for details. If you're having a hard time with SAMs and AAA, you can set the SAMS–AAA setting to None as well....

Ideally, you'll turn your ECM jammer off again as soon as you've broken the radar lock so that you're not broadcasting your presence all over the sky. The enemy may not know precisely where you are, but they'll know enough to come looking for you.

SOLVING INSTALLATION AND HARDWARE PROBLEMS

APPENDIX A



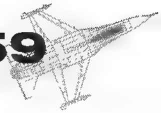
APPENDIX A

Falcon 3.0's extensive video and sound capabilities make far greater demand on your computer than most regular software. This appendix will help you twist and warp your PC so that you can install Falcon 3.0 and its siblings without problems.

CHECKING THAT YOUR SYSTEM WILL RUN FALCON 3

First, make sure that your computer system has the hardware to run Falcon 3.0. The list below shows the minimum requirements, with recommendations in parentheses.

Item	Required (Recommended)
Computer	12-MHz 80286 IBM-compatible (33-MHz+ 80486 or higher)
RAM	1 MB (4 MB—the more the merrier)
DOS	MS-DOS 5 or 6.x, DR-DOS 5.0 or 6.0 (MS-DOS 6.2)
hard drive	at least 12 MB free (3 MB more for Operation: Fighting Tiger, 6 MB more for MiG-29, and 7 MB more for Hornet—28 MB total)
conventional memory	at least 602K free (603K for MiG-29)
Graphics card	VGA (Local Bus)
Monitor	VGA color
Floppy drive	$3\frac{1}{2}$" or $5\frac{1}{4}$" drive (preferably the same size as your Falcon 3.0 disks)



NOTE

While it is possible to get Falcon 3.0 running under OS/2 and Windows, it's not a great idea. At best, you'll get reduced performance and garbled digitized speech; at worst, the features won't work. I wouldn't recommend even trying this.

That's what you *need.* Absolute minimum. If you don't have any of the above, you'll need to get it before you can play Falcon 3.0.

If absolute minimum isn't your style—and let's face it, you'll probably enjoy the simulation more if you can use the fancy features *and* have everything happen at a decent speed—Falcon 3.0 can *use* a bunch more stuff:

- a mouse. (Big deal—you've already got one, right?)
- a joystick, preferably one with a thrust controller. (More on this in Chapter 2.)
- a sound card. (Likewise.)
- lots of RAM. More RAM than you can possibly imagine paying for.
- a modem if you want to play against a live opponent over a phone line.
- a Novell NetWare–compatible network if you want to play against several others on company time.
- a math coprocessor chip (for High-Fidelity flight). If you've got a 486DX-whatever, you've already got one. (This is useful only for Falcon 3.0, not for MiG-29 or Hornet.)

If you don't have all of this wish list, don't worry too much for the moment. Get Falcon 3.0 running, and then decide what you really need.

INSTALLING FALCON 3 PAINLESSLY

Installing Falcon 3.0 is dead simple (though configuring memory is painful), so we'll go through it really quickly. There are a couple of things to be aware of—first, checking that you've got enough free space on your hard disk; second, making a backup copy of your disks before you trash them.

MAKING SURE YOU HAVE ENOUGH FREE SPACE FOR FALCON 3

Falcon 3.0 needs at least 12 MB of free space on your hard disk; Operation: Fighting Tiger needs 3 MB; MiG-29 needs 6 MB; and Hornet needs 7 MB. If you're not sure how much space you've got left, type **CHKDSK** at the DOS prompt; the fifth line of what DOS spits back at you will tell you how much space is free: *2345678 bytes available on disk* or whatever. 12 MB is 12582912 bytes, so the figure needs to be more than that for Falcon 3.0. For Operation: Fighting Tiger you need to have an extra 3145728 bytes; for MiG-29 you need to have 6291456 bytes more; and for Hornet you need to have 7340032 bytes free (that's for installation—once it's installed, it'll shrink down to 5767168 bytes). That's a grand total of 28 MB (29360128 bytes) for installation, and 26.5 MB (27787264 bytes) after installation.

TIP

If you're desperate for disk space after installing Falcon 3.0, delete all the files in the MEDIA directory and turn off Animations in the System Setup screen. That'll save you over 2.5 MB of hard-disk space. Make sure you never turn Animations back on after deleting these files, or Falcon 3.0 will crash. If you're still strapped, and if you don't want any sound, you can delete all the stuff in the Music directory and turn off sound to save another 435 KB.

If you don't like CHKDSK, run the DOS Shell and choose Options ➤ Show Information; the Avail: line in the Disk section shows how much is free. If you don't like the DOS Shell either, use the Windows File Manager.

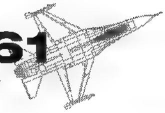
MAKING A BACKUP COPY OF YOUR DISKS

Spectrum HoloByte recommends that you make a backup copy of your Falcon 3.0 disks *and then install from the backup copy*. This is just for your protection—they're not inviting you to copy the disks for your friends too.

To make a backup copy of your disks, use either the DISKCOPY command in DOS

```
DISKCOPY B: B:
```

or go to the Windows File Manager, select Disk ➤ Copy, and follow the instructions.



INSTALLING FALCON 3

Installing Falcon 3.0 takes a few minutes but is quite straightforward (getting it to run is another matter, as you'll see in a moment). Here's what to do:

1. Boot your machine as usual and get to the DOS prompt.
2. Insert the Falcon 3.0 disk numbered 1 into the right-sized floppy drive.
3. Change to the appropriate drive by typing **A:↵** or **B:↵**.
4. Type **INSTALL↵** to run the installation program.
5. If Install finds a sound card in your computer, it will invite you to let Falcon 3.0 use it. *Hint:* Accept. If you don't have a sound card yet, don't worry—you can add one later and introduce Falcon 3.0 to it then.
6. Install will crank up the Install menu offering you the following main options: **Source Drive** shows the drive your Falcon 3.0 disk is in (usually A: or B:). You don't want to change this here—which is lucky, because you can't. **Destination Drive** shows which drive Falcon 3.0 will be installed to. To change this, use the arrow keys to highlight Destination Drive, and then use ← and → to pick the drive you want. **Destination Path for Falcon 3.0** suggests \FALCON3. Change this if necessary by selecting it and typing the new path.

> **NOTE**
>
> **There are also three Tornado options that we won't get into here. If you do choose to install the Tornado demo, it'll cost you 900K of hard disk space.**

7. Select the **Install Falcon 3.0** option and press ↵. Install will install Falcon 3.0 and will prompt you to swap the program disks in and out as it copies them to your hard disk. Then it decompresses them; this takes a few minutes. Read ahead.

INSTALLING OPERATION: FIGHTING TIGER, MIG-29, AND HORNET

Once you've installed Falcon 3.0, installing Operation: Fighting Tiger, MiG-29, and Hornet is a cinch, provided you've got enough space on your hard drive. Three points:

- All three install to your FALCON3 directory.
- You *must* install the games in the right order.
- Installing Operation: Fighting Tiger, MiG-29, and Hornet updates your Falcon 3.0 version, which may cause compatibility problems with live opponents playing older versions of Falcon 3.0.

INSTALLING THE GAMES IN THE RIGHT ORDER

If you're installing Falcon 3.0, Operation: Fighting Tiger, MiG-29, and Hornet, you *must* install the programs in that order. Don't install Operation: Fighting Tiger after MiG-29 or MiG-29 after Hornet—you'll simply have to reinstall everything. (It's fine to install MiG-29 without Operation: Fighting Tiger—just don't install Operation: Fighting Tiger *after* MiG-29. Likewise, you can install Hornet without installing MiG-29, so long as you don't then go and install MiG-29.)

WARNING

Falcon 3.03 can't communicate with earlier versions of Falcon 3.0—only with Hornet, MiG-29, and Falcon 3.03. (The same goes for Falcon 3.02, the MiG-29 update, which can only communicate with MiG-29 and Falcon 3.02. Likewise Falcon 3.01.1, when you install Operation: Fighting Tiger—you'll only be able to communicate with others running 3.01.1, even if you use one of the old theaters.) If you're going head-to-head with live pilots running Falcon 3.0, consider adding MiG-29 and Hornet to a separate copy of Falcon 3.0 rather than your main copy. You can copy and distribute MiG-29's disks 1 and 2 (which update Falcon 3.0 to version 3.02) to other Falcon 3.0 owners so that they can update to Falcon 3.02, but not disk 3, which contains the MiG-29 files. The same goes for Hornet—you can copy and distribute Hornet disks 1 and 2 (the update to 3.03), but you can't copy or distribute disk 3.

COMMUNICATIONS CONCERNS

Operation: Fighting Tiger updates your copy of Falcon 3.0 to version 3.01.1. MiG-29 updates your copy of Falcon 3.0 to version 3.02 so that communications between Falcon and MiG-29 are compatible. Hornet updates your copy of Falcon 3.0 to version 3.03 to allow communications between Falcon, MiG-29, and Hornet. (If you're running a stand-alone copy of MiG-29, Hornet will update that to MiG-29 version 1.02.)

INSTALLING OPERATION: FIGHTING TIGER

WARNING

Installing Operation: Fighting Tiger will delete your old squadrons and trash any campaigns. If this sounds bad, consider installing a new copy of Falcon 3.0 to a different drive or directory and then installing Operation: Fighting Tiger (and maybe MiG-29 and Hornet) there instead. (Install will warn you that it's going to do this.)

Installing Operation: Fighting Tiger is very like installing Falcon 3.0: First, make backups of your disks. Then get to the DOS prompt, insert Operation: Fighting Tiger disk 1, log to the right floppy drive, and type **INSTALL↵**. When Install warns you that it will delete your existing squadrons, choose ↵ to continue or press **Ctrl+Q** to quit the installation.

The Install program finds FALCON.EXE and suggests that drive and directory for Operation: Fighting Tiger. If you've got another copy of Falcon 3.0 in a different directory, edit the path or choose **Ctrl+D** to search for the other copy of FALCON.EXE. Press ↵ when the path is right. As Operation: Fighting Tiger is installed, messages appear on screen telling you which files are being updated. When installation is finished, quit the Install program.

INSTALLING MIG-29

NOTE

Like installation of Operation: Fighting Tiger, installation of MiG-29 will delete all your old squadrons and any campaigns you're engaged in.

Install MiG-29 as you installed Falcon 3.0: Get to the DOS prompt, insert the MiG-29 disk numbered 1 into the right-sized floppy drive, change to the appropriate drive by typing **A:↵** or **B:↵**, and then type **INSTALL↵** to run the installation program. Insert the MiG-29 disks as requested.

The installation program first updates Falcon 3.0 to 3.02, which can take up to half an hour on even a speedy machine. Installing MiG-29 itself takes another quarter of an hour or so.

INSTALLING HORNET

Install Hornet in a similar fashion to the other Falcon 3.0 programs: Get to the DOS prompt, insert the Hornet disk numbered 1 into the right-sized floppy drive, change to the appropriate drive by typing **A:**↵ or **B:**↵, and then type **INSTALL**↵ to run the installation program. Insert the other Hornet disks as requested.

WARNING

Like installation of Operation: Fighting Tiger and MiG-29, installation of Hornet will delete all your old squadrons and any campaigns you're engaged in.

The Hornet installation program first updates Falcon 3.0 to 3.03 (if you're running a stand-alone copy of MiG-29, Hornet updates that to version 1.02), and then installs Hornet itself.

UPDATING FALCON 3 WITHOUT INSTALLING MIG-29, HORNET, OR OPERATION: FIGHTING TIGER

You may want to update your copy of Falcon 3.0 to version 3.02 without installing MiG-29 or to version 3.03 without installing Hornet—for example, if you're fighting modem battles with pilots who have MiG-29 or Hornet (or both).

To update Falcon 3.0 to version 3.02, simply insert MiG-29 disk 1 into a floppy drive, log to it (**A:**↵ or **B:**↵), and type **F3UPDATE**↵. Choose Continue and then choose Install.

WARNING

Again, your old squadrons will be deleted and you'll lose any ongoing campaigns; consider updating a fresh copy of Falcon 3.0 instead. And if you're installing Operation: Fighting Tiger, you still need to do that first.

Getting the Latest Updates to the Falcon 3 Series

Spectrum HoloByte keeps fixing the bugs that players report in the Falcon 3.0 series of games, and you'll do well to upgrade your copies of the games to the latest versions available. You can get the latest patch files from Spectrum HoloByte's BBS or from online services such as America Online (**Ctrl+K**, **SPECTRUM**, **Software Libraries**), CompuServe (**GO GAMBPUB**, **Section 3**), and GEnie (**M805;1**, **Section 18**, **Games RoundTable Libraries**). Read the README files and follow the installation instructions—they vary from patch to patch. At this writing, the latest versions are Falcon 3.04, MiG-29 1.03, and Hornet 1.01.

TIP

To check that your copy of Falcon 3.0 or MiG-29 has been updated, log to your FALCON3 or MIG29 directory and type CHECKVER↵. You'll see a display listing the Falcon 3.0 programs, their version numbers, date, time, and size.

To update Falcon 3.0 to version 3.03 and MiG-29 to version 1.02, insert Hornet disk 1 into your floppy drive, log to it, and type **SHUPDATE↵**. Choose Continue and then choose Install.

FREEING UP ENOUGH CONVENTIONAL MEMORY TO RUN FALCON 3

Falcon 3.0 uses horrendous amounts of conventional memory, and is a challenge for even a well-configured system to run; Operation: Fighting Tiger uses a tad more, and MiG-29 and Hornet more still. This section will help you find enough conventional memory to run the four programs. Here's what they need.

Falcon 3.0D	600K
Falcon 3.0E	602K
Falcon 3.01.1 (Operation: Fighting Tiger)	602K

Falcon 3.02 (MiG-29)	603K
Falcon 3.03 (Hornet)	603K

Unless you're *really* struggling for RAM, aim for 603K so you can run them all.

There are two basic approaches to freeing conventional RAM:

- Edit your CONFIG.SYS and AUTOEXEC.BAT files to squeeze out enough conventional memory to run Falcon 3.0 *and* still be able to run your regular applications, SMARTDrive, network, etc. This is the elegant solution, but tricky. See *Editing CONFIG.SYS and AUTOEXEC.BAT to Free Conventional Memory*.
- Set up stripped CONFIG.SYS and AUTOEXEC.BAT files on a boot floppy. Reboot from the floppy every time you want to play Falcon 3.0. (Simple but tedious.) See *Creating a Boot Floppy*.

If you've got DOS 6.0 or 6.2, you've got a third option:

- Arrange your CONFIG.SYS and AUTOEXEC.BAT files to give you multiple boot configurations—one for Falcon 3.0, one for DOS or Windows, one for whatever you like. You then choose from a startup menu when you boot. This is faster, more convenient, and more flexible than using a boot floppy. See *Creating a Multiple Boot Configuration with DOS 6* a couple of blocks south of here.

NOTE

You *can* use DOS 6's MEMMAKER to optimize memory, but it's been known to have nasty side effects—many people wouldn't touch it with a ten-foot pole. QEMM's Optimize may be a better bet—but back up your CONFIG.SYS and AUTOEXEC.BAT first.

While you're messing with your CONFIG.SYS and AUTOEXEC.BAT files, consider arranging plenty of expanded memory so that you can use Falcon 3.0's options.

ARRANGING EXPANDED MEMORY TO USE FALCON 3'S OPTIONS

Because Falcon 3.0 uses expanded memory (EMS) to do a whole bunch of stuff—loading altitude information and 3-D object information (terrain, horizon), running the Air Combat Maneuvering Instrumentation (ACMI) air videotape recorder (AVTR), and playing radio messages— you need to configure your computer to have as much EMS as possible.

> **TIP**
>
> **If you're not sure how much EMS you have, type MEM /C at the DOS prompt and look at the EMS line. If your system is set up for Windows, it'll probably be set up without any EMS, so you won't see any. Don't worry—you can easily arrange it—read on.**

Change your CONFIG.SYS file to get as much EMS as possible. If you're running Windows, your CONFIG.SYS probably arranges no EMS—look for a line like this:

```
DEVICE=C:\DOS\EMM386.EXE NOEMS
```

Change this to create more EMS. The amount of EMS you can have is the amount of RAM you have minus 1 MB—if you have 4 MB of RAM, you can arrange 3 MB of EMS. To do so, add *NNNN RAM* to your DEVICE=C:\DOS\EMM386.EXE line in CONFIG.SYS. The number to use is 1024 × the number of megabytes:

RAM	**EMS**	**Number to set**
1 MB	—	—
2 MB	1 MB	1024
4 MB	3 MB	3072
8 MB	7 MB	7168
16 MB	15 MB	15360
32 MB	31 MB	31744

Here's how the line should look:

```
DEVICE=C:\DOS\EMM386.EXE 3072 RAM
```

You can set satisfactory amounts of EMS for your different applications more easily by booting from a floppy or by using a multiple boot configuration, which you can do in DOS 6 and which we'll get to in a moment.

EDITING CONFIG.SYS AND AUTOEXEC.BAT TO FREE CONVENTIONAL MEMORY

So you're going to take the hard way—free conventional memory by stripping the unnecessary stuff out of your CONFIG.SYS and AUTOEXEC.BAT files. Here are some guidelines:

- Make sure you're loading DOS high and into upper memory blocks. Type:

  ```
  DOS=HIGH,UMB
  ```

- Load TSRs such as mouse drivers and RAM disks high wherever possible. Type:

  ```
  LOADHIGH MOUSE
  ```

- Don't load TSRs you don't need. If you're not using SHARE, don't load it. Try to keep SMARTDrive if possible, because it will improve your computer's throughput—but if you can't manage your 603K with SMARTDrive loaded, take it out. REM (*rem*ark) out things that you think you might not need (in case you're wrong and you need to restore them):

  ```
  REM LH C:\DOS\SMARTDRV.EXE 1024 512
  ```

- Buy 386 To The Max or QEMM to use instead of EMM386.EXE. These can improve performance by using less conventional memory and allow you to use more extended memory. (*Hint:* Try the other stuff first—it's free. These cost.)

TIP

Copy your CONFIG.SYS and AUTOEXEC.BAT before stripping stuff out of them, just in case you screw up. Make copies named something like CONFIG.DED and AUTOEXEC.DED as backups.

If these measures don't cut it for you, either create a boot floppy to crank up your computer with a suitable amount of free conventional RAM or invest in DOS 6 so that you can use multiple boot configurations.

CREATING A BOOT FLOPPY

A *boot floppy* is a floppy disk containing system files that you put into your computer's drive A and then reboot to produce a different configuration from that on your hard drive.

Using a Boot Floppy to Run Falcon 3

Boot floppies have a really bad reputation—by some definitions, the boot floppy is the unlabeled, unjacketed 5¼" dust bunny lying on top of a computer—and may seem like a kludgy solution to your memory problems. Now, it's true that you wouldn't want to boot your computer from a floppy regularly—it's much slower than booting from the hard disk, and it ties up a floppy drive. But for special effects like enabling your computer to run Falcon 3.0 and its cohorts without preventing it from running your other applications, a boot floppy is a neat, even elegant solution (not as elegant as a multiple boot configuration). The other good thing about running Falcon 3.0 from a boot floppy is that you can prevent anyone else from using Falcon 3.0 by removing the boot floppy. Like, if you don't want your kid brother wrecking your campaigns, label the boot floppy Persian 101 or something equally tedious, and hide it in your stack of floppies.

Here's how to create a boot floppy to run Falcon 3.0:

1. Format a disk in drive A as a system disk:

   ```
   FORMAT A: /S
   ```

   DOS will format the disk and copy COMMAND.COM to it.

2. When DOS offers to format another disk for you, press **N** to decline.

3. At the DOS prompt, enter **EDIT A:CONFIG.SYS** ↵ to start the Edit text editor and create a new CONFIG.SYS file on the A drive.

4. Enter the file text:

   ```
   DEVICE=C:\DOS\HIMEM.SYS
   DOS=HIGH,UMB
   LH C:\DOS\SMARTDRV.EXE 1024 512
   FILES=30
   BUFFERS=30
   ```

5. Save the new CONFIG.SYS file by selecting File ➤ Save.

6. Select File ➤ New to close the new CONFIG.SYS file.

7. Create a new AUTOEXEC.BAT file containing a basic setup such as the ones below (substitute your mouse driver's details for *MOUSE*). If you have Windows, your system should have a Windows mouse driver and a DOS mouse driver. Use the later one—use the Windows 3.1 driver over the DOS 5 driver, and use the DOS 6 driver over the Windows 3.1 driver.

   ```
   PROMPT $P$G
   PATH C:\DOS
   LOADHIGH MOUSE
   MEM /C
   ```

8. Select File ➤ Save to save your new AUTOEXEC.BAT file. Enter **A:AUTOEXEC.BAT** as its name.

9. Get out of Edit by selecting File ➤ Exit.

NOTE

The MEM /C line isn't really necessary—it's just there to confirm that you've got enough conventional memory free to run Falcon 3.0.

CREATING A MULTIPLE BOOT CONFIGURATION WITH DOS 6

If you have DOS 6.0 or 6.2, you can create a CONFIG.SYS file and an AUTOEXEC.BAT file to set up your computer for different configurations—for example, one for running Falcon 3.0, one for other games that demand vast amounts of conventional memory (and perhaps expanded memory), and a third (fourth, fifth, whateverth) for using your regular applications. DOS 6 lets you crank up a menu of different choices before you run your CONFIG.SYS file—a great improvement over previous versions. (DOS 6.2 lets you single-step through your CONFIG.SYS and AUTOEXEC.BAT files, deciding which lines to use. This can be great for working out which TSRs are giving you trouble.)

TIP

Write a batch file to load Falcon 3.0 (or MiG-29 or Hornet) more quickly. Start Edit by typing EDIT at the DOS prompt, enter CD C:\FALCON3↵ and FALCON3↵, choose File ➤ Save, give it an easy-to-remember name (e.g., F3 or FALC), and then choose File ➤ Exit. To run the batch file, type the name you gave at the DOS prompt (F3) and press ↵. Alternatively, if you're booting from a floppy drive so as to have enough conventional memory free to run Falcon 3.0, consider putting the CD C:\FALCON3↵ and FALCON3↵ commands at the end of the AUTOEXEC.BAT on the floppy disk.

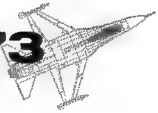
This isn't a DOS manual, so we won't grind through step by step; but here's what a CONFIG.SYS file for DOS 6.0 might look like:

```
[MENU]
MENUITEM=FALCON3,Falcon
MENUITEM=MIG, MiG-29
MENUITEM=HORNET, Hornet
MENUITEM=NORMAL, DOS or Windows
MENUDEFAULT=NORMAL
MENUCOLOR=7,1

[FALCON3]
DEVICE=C:\DOS\HIMEM.SYS
DOS=HIGH,UMB
DEVICE=C:\DOS\EMM386.EXE 2048 RAM
FILES=30
BUFFERS=30
```

```
[MIG]
DEVICE=C:\DOS\HIMEM.SYS
DOS=HIGH,UMB
DEVICE=C:\DOS\EMM386.EXE 2048 RAM
FILES=30
BUFFERS=30

[HORNET]
DEVICE=C:\DOS\HIMEM.SYS
DOS=HIGH,UMB
DEVICE=C:\DOS\EMM386.EXE 2048 RAM
FILES=30
BUFFERS=30

[NORMAL]
DEVICE=C:\DOS\SETVER.EXE
DEVICE=C:\DOS\HIMEM.SYS
DEVICE=C:\DOS\EMM386.EXE /NOEMS
DOS=HIGH,UMB
FILES=50
STACKS=9,256
BUFFERS=10,0
SHELL=C:\DOS\COMMAND.COM C:\DOS\  /P
```

Briefly, here's what happens (you can figure out the details for yourself):

- **[MENU]** produces the start-up menu. **[MENUITEM]=FALCON3, Falcon** denotes a menu item called FALCON3 that appears on the menu as *Falcon*. (The other items are *MiG-29*, *Hornet*, and *DOS or Windows*.)
- **MENUDEFAULT=NORMAL** makes Normal the default choice (way to be!). **MENUCOLOR=7,1** sets white text on a blue background (type **MENUCOLOR /?**↵ at any convenient DOS prompt for the other colors).
- **[FALCON3]**, **[MIG]**, **[HORNET]**, and **[NORMAL]** mark the section of CONFIG.SYS that gets executed when you make your choice from the start-up menu.



Here's what an AUTOEXEC.BAT for DOS 6 might look like:

```
@ECHO OFF
GOTO %CONFIG%
:FALCON
PROMPT $P$G
PATH C:\DOS;C:\MOUSE
LH C:\DOS\SMARTDRV.EXE 1024 512
LH C:\MOUSE\AMOUSE
CD FALCON3
FALCON3
GOTO END

:MIG
PROMPT $P$G
PATH C:\DOS;C:\MOUSE
LH C:\DOS\SMARTDRV.EXE 1024 512
LH C:\MOUSE\AMOUSE
C:
CD FALCON3
MIG29
GOTO END

:HORNET
PROMPT $P$G
PATH C:\DOS;C:\MOUSE
LH C:\DOS\SMARTDRV.EXE 1024 512
LH C:\MOUSE\AMOUSE
CD FALCON3
HORNET
GOTO END

:NORMAL
C:\DOS\SHARE.EXE /L:500 /F:5100
LH C:\DOS\SMARTDRV.EXE 1024 512
PROMPT $P$G
PATH
C:\DOS;C:\EXCEL;C:\CPS;C:\WINWORD6;C:\WINDOWS;C:\MOUSE
LH AMOUSE
SET TEMP=C:\TEMP

:END
```

The key to this is the GOTO %CONFIG% line, which tells AUTOEXEC.BAT to use your choice from the CONFIG.SYS file (*viz.* from the start-up menu) to determine which block of the AUTOEXEC.BAT to run.

(The blocks are denoted by labels that start with a colon—**:FALCON**, **:MIG**, **:HORNET**, and **:NORMAL**.) Note that you need to specifically skip the sections you don't want to run (here I've used **GOTO END** and an **:END** label), unlike in the CONFIG.SYS.

When you've edited your CONFIG.SYS and AUTOEXEC.BAT files to your satisfaction, reboot using the three-finger salute (**Ctrl+Alt+Delete**) or the Reset button and cross your fingers. Make your choice from the start-up menu. If things go wrong and you're running DOS 6.2, press **F8** at the start-up menu to execute CONFIG.SYS and AUTOEXEC.BAT one line at a time so that you can pinpoint what's wrong.

TIP

If you're feeling subtle, you can arrange your AUTOEXEC.BAT with a set of common commands in a common section (perhaps called :COMMON—no prizes for originality here) and use a GOTO COMMON line to access it. Saves space, adds style. The AUTOEXEC.BAT shown above is about as subtle as a flying brickbat, but it works jus' fine.

TO START FALCON 3

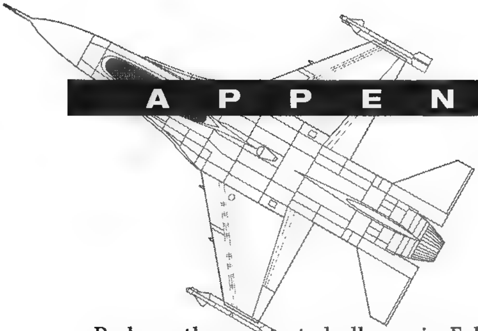
If you didn't set up a boot floppy or multiple boot configuration to fire you automatically into Falcon 3.0, here's how to start Falcon 3.0:

1. Switch to the Falcon3 directory: Type **CD FALCON3↵.**
2. Type **FALCON3↵.** Falcon 3.0 will fire up.

Now that you've got Falcon 3.0 installed and running, you need to know what's what where on the screen. Scoot back to Chapter 1, get your motor running, and get out on the flyway....

FIGHTING HEAD-TO-HEAD OVER NETWORKS AND MODEMS

APPENDIX B



APPENDIX B

Perhaps the greatest challenge in Falcon 3.0 lies in Communications mode, where you can fly missions with—or against—up to five other players. You may have gotten used to flying missions with computer-controlled wingmen, but can you handle the real thing—wingmen who may not obey your commands, or who may be unable to execute them?

Falcon 3.0, MiG-29, and Hornet let you play either over modems or with a direct link via a null-modem cable (with one other player), or through a Novell network (with up to five others). In the coming sections, we'll look at the hardware and software you need and how to put it together and get the simulation running.

WHAT YOU NEED TO USE COMMUNICATIONS MODE

Here are the three ways to play Falcon 3.0 in Communications mode:

NOTE

Each computer used for multiplayer play should have a registered copy of Falcon 3.0 installed (and Operation: Fighting Tiger, MiG-29, and Hornet if applicable).

Direct Connection Simply connect the serial ports on two computers with a null-modem serial cable.

Modem Connection Connect two computers by using two Hayes-compatible modems and the services of a friendly phone company.

Novell NetWare–compatible LAN If your computers are connected to a NetWare-compatible LAN, you can play through it. (This is a great solution for boredom at work.) You need an expanded-memory manager that can load your networking software into high memory

TIP

2400-bps modems will do, but only if you're desperate or exceptionally patient—9600 is far better. The computers have to exchange a ton of Falcon 3.0 information before you can start flying, and at 2400 bps, it can take a while. If you're buying a modem, get one capable of at least 9600 bps (14,400 is preferable), and consider it an investment.

(more on this in a moment). You need to have Falcon 3.0 installed on each computer involved—*not* on the server. (Just as well—installing the Falcon 3.0 series to the server just might get you fired.) You can get away with installing Falcon 3.0 to a network drive, but bear in mind that it won't run as fast or as smoothly—and you need a copy of Falcon 3.0 installed for each player; you can't have several players running the same installation of Falcon 3.0 off a network drive. Again, bear the wrath of your network administrator in mind before you do install to a network drive.

CHOOSE A TYPE OF PLAY

You can choose from four multiple-player modes, depending on your hardware and personnel:

- **Two-Player Allied:** Two allied pilots fighting for the same side in a campaign.
- **Two-Player Duel:** Two opposing pilots fighting a duel. You'll be the only aircraft in the sky, and you fight to the death.
- **Multi-Player Allied:** Two to six allied pilots fighting for the same side in a campaign.
- **Multi-Player Duel:** Two to six pilots fighting each other until all but one are shot down. Again, these will be the only aircraft in the sky.

As mentioned above, the multiple-player configurations need a network—you can't connect more than two players by using modems.

ARRANGING COMMUNICATIONS PLAY

So, you're ready for head-to-head combat or a combined mission. Let's do it!

POWER UP

First, switch on your computer and get it ready to connect:

- If you're using a modem, make sure it's plugged in to a suitable COM port and switched on.
- If you're using a network, make sure it's running. Then load your network drivers high (see the sidebar coming up in a moment for details on arranging a suitable AUTOEXEC.BAT to do this) and you're ready to rock and roll.

COOKING UP AN AUTOEXEC.BAT TO LOAD NETWORK DRIVERS HIGH

If you've already managed to get Falcon 3.0 to run on your computer, you should find this bit pretty easy. You just have to persuade your memory manager to whip the NetWare drivers up into high memory, and you'll be all set.

If you're using a boot floppy to run Falcon 3.0, use DISKCOPY to duplicate it, and then edit the AUTOEXEC.BAT on the duplicate to include the lines **LOADHIGH C:\NET\IPX** and **LOADHIGH C:\NET\NET** (use the appropriate drive and directory if your drivers aren't in C:\NET, and abbreviate LOADHIGH to LH if you want). Try loading your mouse after the network drivers to make sure there's enough room in high memory for the network drivers; if necessary, sacrifice your mouse to get the network drivers in position.

If you've got DOS 6.*x* and are using a multiple-boot configuration, add to your CONFIG.SYS and AUTOEXEC.BAT a new Network Combat (or whatever) section including the lines in the previous paragraph so that you can boot and load your net drivers quickly.

If you don't want to muck about with your AUTOEXEC.BAT now that you've finally got it working, you can always load your net drivers by entering **LOADHIGH C:\NET\IPX↵** and **LOADHIGH C:\NET\NET↵** at the DOS prompt after booting normally.

Once you've loaded your network drivers, you'll need to log in as usual (and enter your password, if you use one).

One more thing—your NetWare-compatible LAN needs to be Novell IPX protocol-compatible. Falcon 3.0 won't work with NetBIOS.

GET FALCON 3 RUNNING

TIP

Get the latest versions of Falcon 3.0, MiG-29, and Hornet—Spectrum HoloByte keeps improving the comms files. See Appendix A for details.

Next, get Falcon 3.0 running on your machines. (Or MiG-29, or Hornet—whatever. Remember that all the computers involved need to be running the same version of Falcon 3.0—3.0E, 3.01.1, 3.02, 3.03, or 3.04. Differing versions will screw things up.)

DESIGNATE A CALLER

Whichever way you're communicating, one player needs to be the caller—the catalyst that gets things moving. Because the caller's computer coordinates the communications and will work harder than the other computers, choose the person with the fastest computer to be the caller. There's one other consideration—if you're playing with more than one game (e.g., Falcon 3.0, MiG-29, and Hornet) and anyone's using Falcon 3.0 (as opposed to MiG-29 or Hornet), one of the Falcon 3.0 players has to be the caller, or else you won't be able to establish a communications session. If no one is using Falcon 3.0, the caller in a multigame communications session must be using Hornet (i.e., *not* MiG-29).

The caller also gets to have the most fun, deciding the following:

- which game everyone will play
- which theater you will fly in
- how the mission is set up
- most of the difficulty settings: Enemy Logic Level, Weapons Effectiveness, SAMS–AAA, Limited Fuel and Armament, Limited Chaff–Flares, and Campaign level. (All that leaves the answerers to set is their individual flight models, HUD, radar, and Redout–Blackout settings.)

NOTE

The caller's computer is called the *master*; the other computers are the *slaves*. (Don't ask, and don't get any ideas. Just read on.)

Designate a Master MiG

You'll need to designate a Master MiG as well as a caller if more than one player is using MiG-29. Since the Master MiG's computer oversees all MiG-29 action, you need to choose the fastest computer using MiG-29 to be the Master.

SELECT A SQUADRON AND THEATER

Next, you select a squadron and theater as usual in the War Room. Then click the COMMS monitor in the War Room to get to the Pilot Transfer Screen, where you pick the pilot as whom you'll fly. When you've chosen yourself, click the Comms button to get to the Communication Setup screen.

SET THE COMMUNICATIONS OPTIONS

In the Communication Setup screen, make your choices for the game:

Mode The caller clicks CALL; the answerers click ANSWER.

Port If you're using a modem or null-modem cable, choose COM 1 or COM 2 (Falcon 3.0 doesn't use COM 3 or COM 4); if you're using a network, leave this alone.

Line Type If you're using a modem, choose TONE for a touch-tone phone; choose PULSE for a pulse-dialing phone.

Telephone If you're connecting by modem, the caller enters the victim's phone number here (without hyphens). Click on the Telephone field so that the mouse pointer disappears, enter the number, and press ↵ to restore the mouse pointer.

Connection Choose MODEM, DIRECT, or NETWORK, depending on your connection.

Game Type All players select the type of game: 2 PLAYER ALLIED, 2 PLAYER DUEL, MULTI PLAYER ALLIED, or MULTI PLAYER DUEL. (Everyone has to make the same choice.)

Baud Rate For a modem connection, choose the fastest possible speed that both modems can manage. (Even if your modem supports it, don't use compression —Falcon 3.0 doesn't like it.) For a null-modem connection, choose the 19,200-baud speed. For a network connection (in which the baud rate controls how much data is being transmitted rather than how fast it is transmitted), try the 19,200-baud speed first. Change to a lower baud rate if the game won't run fast enough.

ACCEPT YOUR CHOICES

Once you've made your choices, click the Accept button. (If you messed something up, click the Cancel button instead.)

TIP

If you intend to reuse the settings you've made on the Communication Setup screen, click the Save Settings button to store them and then start the communications session—you won't need to click the Accept button.

CONNECT TO YOUR OPPONENTS

Once you've hit the Accept button (or the Save Settings button), Falcon 3.0 (or MiG-29, or Hornet) will start trying to connect you to your opponents:

Modem connection Falcon 3.0 will pop up the Modem Defaults dialog box to ask if you want to use the modem defaults. Answer **Y** to have the program start dialing your opponent.

Direct connection The computers will connect to each other.

NOTE

You can bypass the modem defaults by choosing N in the Modem Defaults dialog box and entering commands of your own. You might want to do this if you need to enter an ultra-long phone number (more than 18 numbers), if you need to enter a credit-card code, or if you can't connect by using the modem defaults.

Network connection The caller chooses the players from a list of network login names in the Select Opponents dialog box that pops up on his or her screen (at first, the caller will see a *Looking for players* message as Falcon 3.0 scans the network for falconers busily clicking their Accept buttons); the answerers will see a *Waiting to connect* message. The caller uses ↑, ↓, →, or ← to reach the names and presses ↵ to select the ones he or she wants; a star will appear next to each selected name. When the caller has chosen all the names, he or she chooses the Exit option to begin the communications session. The caller will then see a message saying *Waiting for other side to connect*; the answerers will see a message asking *Do you want to play with [name]?* (Occasionally, a network may not know a player's name for some bizarre reason. Don't worry—it may work nonetheless.) When the answerers respond affirmatively to this, the communications session starts. The caller will see a message saying *Waiting to synchronize all players*, and all the players will then have to wait a couple of minutes while the computers swap data. You'll see a bunch of colored boxes zipping about the *RECEIVING SATELLITE DOWNLINK* screen to indicate that your computer is thinking hard, and then you'll be invited to calibrate your joystick (if you're using one.)

NOTE

If the caller chooses the Exit option without selecting any players, Falcon 3.0 will dump him or her back in the War Room.

PLAYING IN COMMUNICATIONS MODE

Once you're through the above sections, the game will begin.

FIGHTING DUEL GAMES

Duel-game mode is similar to Instant Action in that you'll find yourself on your own in a sky full of enemies hell-bent on your destruction. You can blaze away safely without fear of killing anyone who matters to you.

NOTE

In multiple-player duels involving F-16s, MiG-29s, and Hornets, the IFF on both F-16 and Hornet will recognize those aircraft as friends and the MiG-29s as foes. The IFF on the MiG-29s will do the opposite. But the aim is still to shoot everyone else down. Go figure.

The game continues until all planes but one have been knocked down. You'll then see the Top Ten Scores screen; when you're done with that, you'll be asked if you want to play again. Provided at least two players want to play again, you can start another game. Alternatively, you can exit to the War Room.

One more thing—you won't be able to tell if any of your opponents are using the autopilot to pull fancy moves and stitch you up. Keep your wits about you, and never get overconfident.

FLYING ALLIED GAMES

NOTE

The caller can't set altitude or speed for waypoints because the answerers are not controlled by computer.

In allied-game modes, you can fly campaign missions with your friends. After the caller has established the communications session, you'll see the War Update screen. Then the caller (acting as squadron commander) sets the details for the mission—waypoints, flights, weapons, etc.—while the answerers pretend to be computer-generated pilots (they don't get to make any choices). Pilots are assigned automatically to aircraft.

NOTE

For duels involving multiple players and multiple games, you need to have players join the game in the right order: First, the caller; second, the other Hornet or Falcon 3.0 players; then the Master MiG-29; and finally the other MiG-29 players.

The mission begins when the caller clicks the Takeoff button in the Load Armament screen. The caller gets to take off; the answerers, who start in the air, then join the caller and fly the mission together.

COMMUNICATING IN COMMUNICATIONS MODE

You can send radio messages of up to about 60 characters to other pilots in your flight: Press ‘, type the message, and press ↵ to send it. Watch your six while you're doing this—you're vulnerable when your attention is split.

ENDING THE COMMUNICATIONS SESSION

Once the comms session has started, only the Caller can pause it (by pressing **P**) or end it (by pressing **Alt+Q**). Answerers can press **Alt+A** to abort a mission or **Alt+X** to exit to DOS; either leaves their planes flying in a straight line—sitting targets for anyone who comes along.

NOTE

You can't eject in a communications game. This should help put a little determination in your fighting.

USING HIGH-FIDELITY RADAR AND ACMI

APPENDIX C

APPENDIX C

This appendix looks at two advanced features of the Falcon 3.0 family of simulations—High-Fidelity Radar mode and Air Combat Maneuvering Instrumentation. Since space is limited and the radar in the MiG-29 and Hornet works very similarly to that in the F-16, I'll concentrate on the F-16 here.

USING HIGH-FIDELITY RADAR

The High-Fidelity Radar in the Falcon 3.0 series is incredibly realistic—which makes it a real brute to use. To become proficient with the High-Fidelity Radar, you'll need to be prepared to put in some time and practice. But the results High-Fidelity Radar will give you will more than justify the effort.

In HFR, you need to set the following:

Azimuth Scan The horizontal sweep of the radar antenna. Press **F9** to choose 20°, 60°, or 120°, depending on the area of sky you want to watch. You'll see the azimuth scan represented by an upside-down T moving across the bottom of the radar display in the range you selected.

Elevation Scan The vertical scan of the radar antenna—whether it simply scans one level or moves up and down. Press **F10** to choose one bar, two bars, or four bars of elevation scan. The more bars you scan, the more of the sky you'll see, but the more slowly your radar display will be updated. The elevation scan is represented on the REO by the two numbers in the top-right corner (showing minimum and maximum elevations in the scan) and by top and bottom bars on the altitude scale on the left of the REO.

Range The distance the radar scans. Press **F8** to cycle through 10 nm, 20 nm, 40 nm, and 80 nm. (Press **Shift+F8** to cycle backwards.) The range is displayed at the top left of the radar display next to the mode—for example, 10 STT for Single Target Tracking mode with a 10-nm range—and the radar screen adjusts to represent that distance from the bottom (where your aircraft is) to the top.

HFR displays a *target history*—it represents the last three positions of a target as a fading trail so that you can see a target's movement.

HFR has four modes for different types of radar work:

- NAM (Normal Air Mode) is a good mode in which to start off a mission.
- SAM (Situation Awareness Mode) gives you details about individual targets while allowing you to track multiple targets. Use it when you need to identify targets before deciding which to attack first.
- STT (Single Target Tracking mode) is what you need when you've singled out an enemy to hunt.
- ACM (Air Combat Maneuvering mode) is best for close-in work—for example, dogfighting.

USING NAM MODE TO FIND TARGETS

Press **F5** to engage NAM mode (see Figure C.1). You'll see the default range of 20 nm; press **F8** to change this if necessary. NAM mode shows only the distance range (in the upper-left corner) and the elevation range (upper-right). You can determine how far a target is from your aircraft by its position on the screen—halfway up the screen with a 20-nm scan puts the aircraft 10 nm away from you, and so on—and its position relative to you.

To select a target, press **T**. This will move the Acquisition Corral—two parallel vertical lines—to it, and you'll see the Search Target Altitude Bar at the left edge of the REO to indicate the target's height (at the point on the side of the Search Target Altitude Bar) on the altitude scale. The two 3s on the altitude scale represent 30,000 feet.

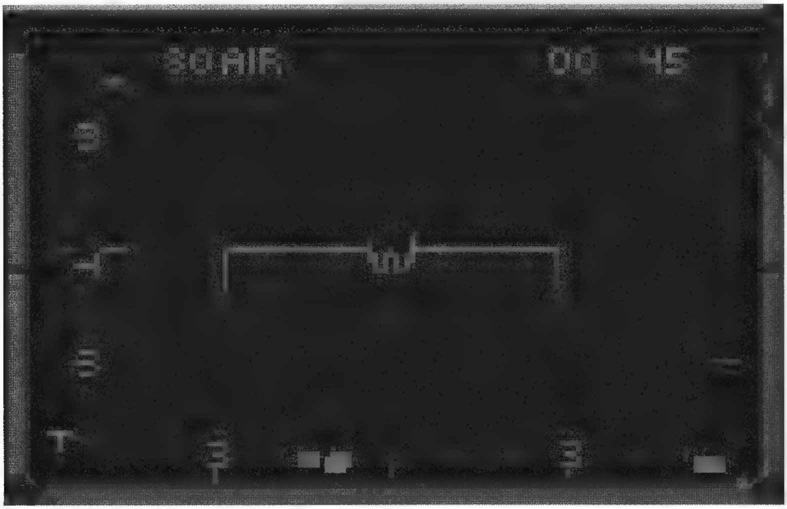


FIGURE C.1 *NAM mode*

USING SAM MODE TO GET DETAILS ON TARGETS

Once you've placed the Acquisitions Corral on a target that interests you, press **Z** to switch into SAM mode (see Figure C.2) and lock up the target. The target will change from a blip to a diamond, and you'll see more readouts for it—the heading, airspeed, altitude, aspect angle, bearing, distance, and closure rate.

If you decide not to pursue the target you've locked up in SAM mode, press **X** to break the lock and return to NAM mode.

NOTE

In SAM mode, you maintain a lower radar profile to the enemy's Threat Warning System and are less likely to be noticed than in STT mode.

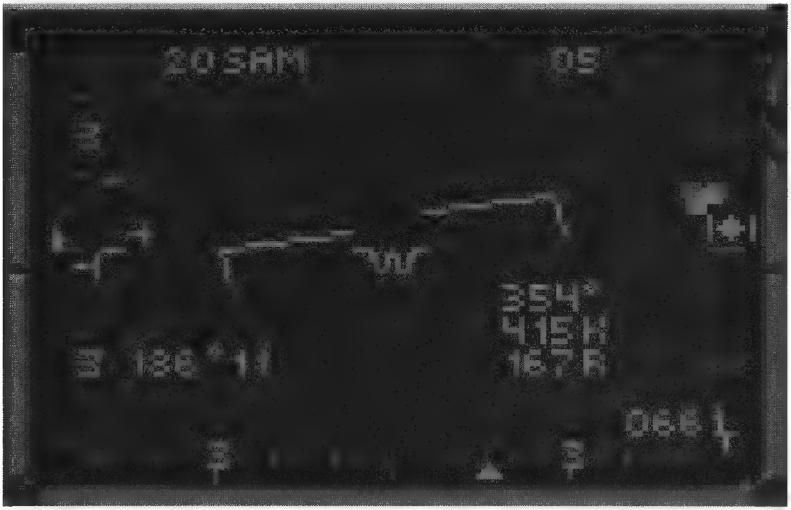


FIGURE C.2 *SAM mode*

LOCKING UP A TARGET IN STT MODE

Once you've locked up a target in SAM mode and want to go all the way, press **Z** again to switch to STT mode (see Figure C.3). This locks the radar antenna on the target and removes other blips from the screen. Attack before the enemy notices that you've locked him up.

USING ACM MODE FOR QUICK WORK

When you're in a dogfight and don't have the time to lock targets up manually, press **F6** to engage ACM mode (see Figure C.4), which automatically locks up the closest target. ACM uses a range of 10 nm and switches back to STT once it's locked up a target for you.

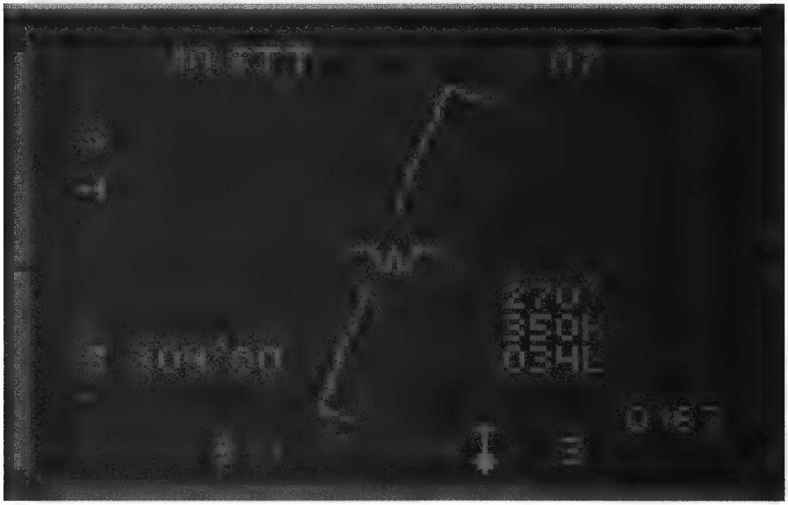


FIGURE C.3 *STT mode*

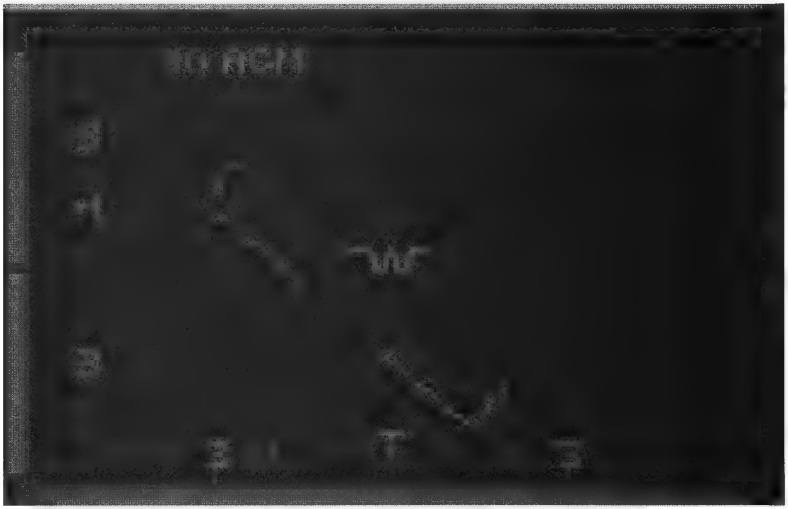


FIGURE C.4 *ACM mode*

USING GROUND MAP MODE

Use Ground Map mode (GM—see Figure C.5) to view the ground in front of you for landmarks or targets. The range is fixed at 20 nm, but you can zoom to 2×, 4×, 8×, or 16× magnification by pressing **F1** (press **F2** to zoom back out). Press **Shift+I**, **J**, **K**, and **L** to move the zoom rectangle about to view different areas of the REO. Press **Y** to toggle roads and rivers on and off to improve or speed up your view.

If you chose a target when setting up the current mission, GM mode will show the target's bearing in its lower-left corner and will display a diamond or a crosshair for targeting when the target is in sight.

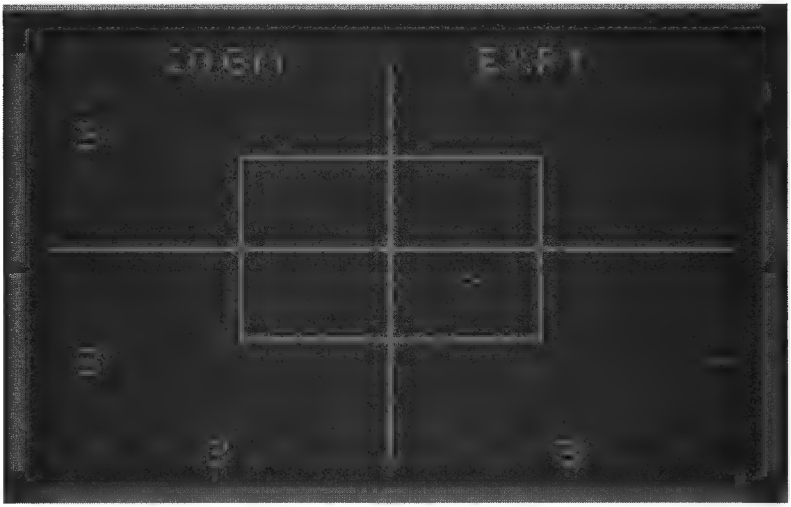


FIGURE C.5 *Ground Map mode*

USING ACMI

ACMI—Air Combat Maneuvering Instrumentation—is a major feature of the Falcon 3.0 series of simulations that allows you to review and analyze your combat missions. By using ACMI's Replay mode, you can review missions in any of Falcon 3.0's views to improve your technique in combat—or just to impress your friends. By using the ACMI mode, which represents all participants in a mission—from aircraft and tanks down to individual missiles and bullets—you can see how the different aircraft perform in combat.

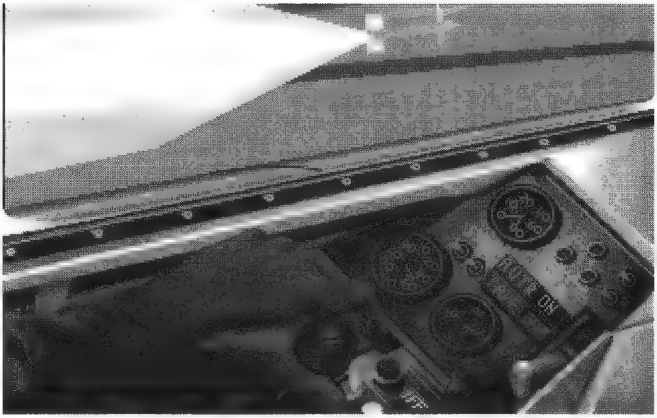
NOTE

To use ACMI, you need to have expanded memory (EMS) available. See Appendix A for details on configuring expanded memory.

RECORDING ACMI INFORMATION

To record ACMI information, you use the Airborne VideoTape Recorder (AVTR) mounted in your plane. Turn it on and off by pressing **Ctrl+R**. Each time you turn the AVTR off, it marks the tape with an *index*, an electronic bookmark that allows you to access that portion of the tape quickly (like accessing track on a CD).

You'll be able to record about 20 minutes of mission for each megabyte of EMS you have available. When the AVTR is running, the green bar that you see in Left view will gradually disappear, indicating how much tape (viz., EMS) you have left.



When you're running out of tape, press **Ctrl+S** to save the data in EMS to disk and recover the EMS.

TIP

Your ACMI tapes will be ten times as entertaining if you don't record the mundane parts of missions but turn on the AVTR only when blood and thunder is imminent. They'll also be smaller. At the end of the mission, Falcon 3.0 will prompt you to save the replay tape. Bear in mind that AVTR files can be quite large, and that keeping too many will fill up your hard disk. AVTR files have a .VCR extension, so they're easy to identify in your FALCON3 directory. Note that if you choose File ➤ Abort Mission to end a mission, you'll erase your current AVTR recording. Still, if you're willing to abort the mission, you probably *want* to erase the tape too....

VIEWING AN AVTR REPLAY

Start ACMI by clicking the ACMI screen in the War Room or clicking the ACMI button on a screen in Campaign or Red Flag. In the Load/Save dialog box, use ↑, ↓, **PageUp**, and **PageDown** to select the tape you want, and then press **L** to load it or **S** to save it.

Once you've loaded a tape, you'll find yourself in Replay mode. Use the controls and readouts on the Control Panel to view the tape:

- Use the Play (**V** key), Stop (**B**), Frame (**N**), Fast Forward (**M**), Previous Index (<), and Next Index (>) buttons to view the AVTR tape as you would a laser disc. Press ↵ to hide the control panel so that you can see the action better.

TIP

To rename an ACMI tape, highlight its name, and then press Tab to erase the name. Enter a new name.

- Click the Power button or press **Esc** to exit ACMI and return to whence you came.
- Click the Load button or press **L** to open the Load/Save dialog box to select a different tape.
- Click the Counter Reset button or press **C** to reset the counter to zero.
- Click the ACMI button to access the ACMI mode; click the Replay button for Replay mode. Alternatively, press **Tab** to toggle between the modes.

- Use the Counter, Timer, and Index No. displays to keep track of where you are in your current tape.
- Click the Zoom buttons to zoom in or out in external views, or press **F1** and **F2**, respectively.
- Click the Rotate buttons to rotate the view in external modes, or press **F3** and **F4**, respectively.
- You can use the Cockpit and External View Selection buttons to shift through the cockpit and external views, but you'll probably find it easier to use the keyboard. The keys work the same as in flight modes—**3** for Front view, **6** for Right view, **9** for Track view—with the exception of the following: **2** is for Enemy view, **8** is for Missile view, and **0** is for Independent view. In Independent view, you can use ↑, ↓, →, or ← to move your view position in the direction shown by the arrow, or **PageUp** and **PageDown** to move your eye position up or down.

TIP

You can review your performance in a mission while still in the air by pressing Esc to bring up the menu bar and then choosing File ➤ Replay. When you're through viewing the tape, select File ➤ Return to Game. A quick warning: Don't do this with a valuable tape, because ACMI has been known to crash when being viewed from inside the simulation.

USING THE ACMI OPTIONS

In the ACMI mode, you can use the Trail buttons or the [and] keys to shorten or lengthen the *contrails*—the colored lines (green for the right wing, red for the left wing) tracing each aircraft's path.

To judge altitudes, click the Alt Line button or press **F7** to display the altitude line from the center of a plane or missile down to the ground.

Click the Plane Info button or press **F8** to see Plane Information: ID number, Altitude, Speed, and Heading. Press **F9** and **F10** to move through the planes in view.

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Note to the Reader: **Boldface** page numbers indicate definitions and primary discussions of topics and subtopics. *Italic* page numbers indicate illustrations.

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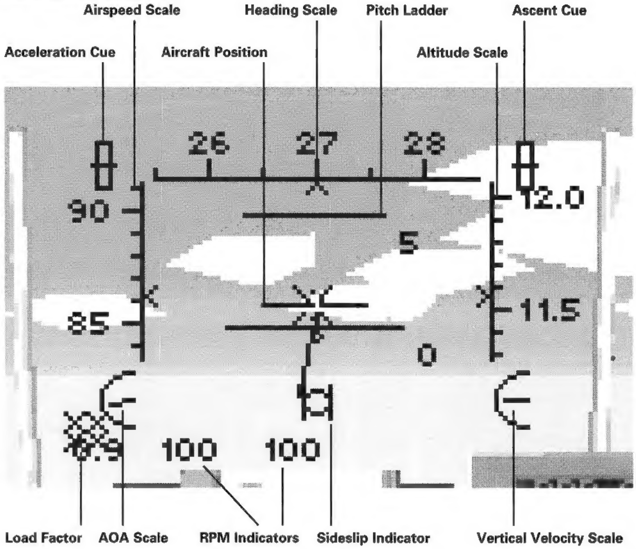

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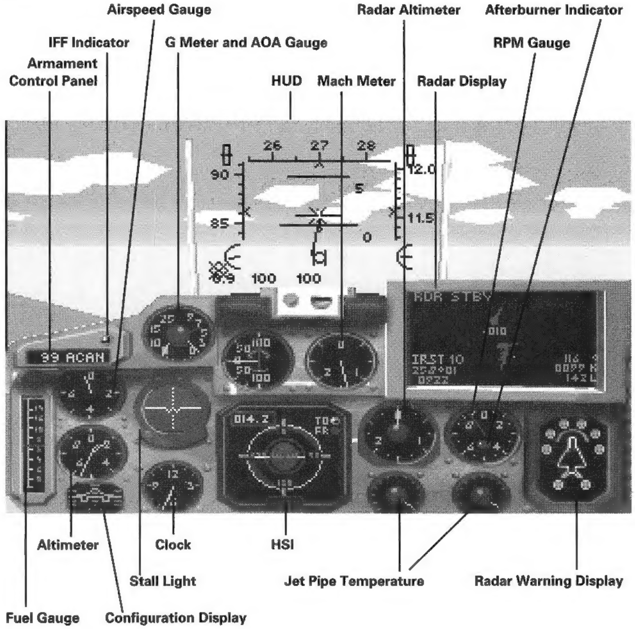

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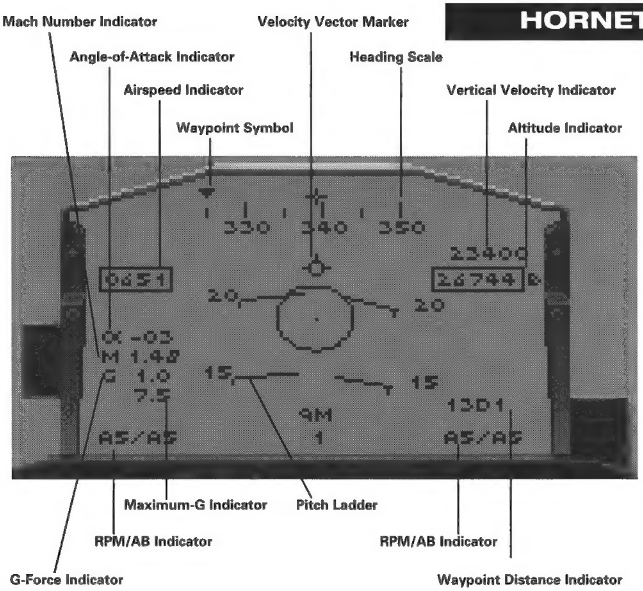

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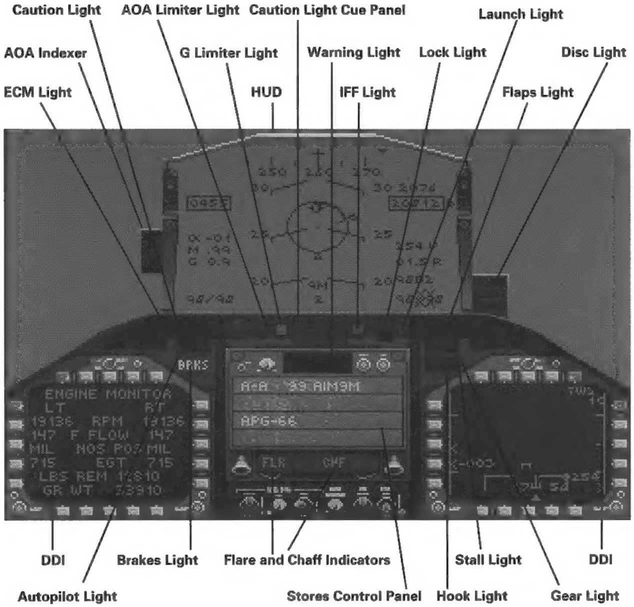

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